Guidelines on the collection of demographic and socio-economic information on fishing communities for use in coastal and aquatic resources management

These guidelines specify key indicators for the identification of demographic issues in coastal area management and for monitoring the impact of management measures on the socio-economic well-being of coastal and fishing communities. The guidelines also identify data sources and methods for the collection of data. Case studies on the use of demographic data in coastal area management in Italy and the United States of America and a summary of the proceedings of a regional workshop on the use of demographic data in coastal area management in the Philippines and other Southeast and South Asian countries provide practical examples of how demographic indicators are used.
Cover photograph:
A small fishing vessel comes ashore in the Philippines where boats are often used to ferry passengers and goods.
FAO/J. Holmes
Guidelines on the collection of demographic and socio-economic information on fishing communities for use in coastal and aquatic resources management

by
Lolita V. Villareal
Consultant
The Food and Agriculture Organization of the United Nations (FAO) Committee on Fisheries (COFI), at its twenty-fifth session, recognized that small-scale fishing communities are faced with an array of serious problems. These problems include rapid population growth, migration of populations, overexploitation of resources, lack of alternative sources of employment, displacement in coastal areas due to industrial development and tourism, pollution and environmental degradation. In the context of the Code of Conduct for Responsible Fisheries (CCRF), the Committee requested FAO to provide guidance on increasing the contribution of small-scale fisheries to food security and poverty alleviation.

Article 10 of the CCRF and the FAO Technical Guidelines for Responsible Fisheries No. 3 set out principles and standards for the integration of fisheries into coastal area management and specify the broad socio-economic and demographic parameters to be taken into consideration.

The guidelines and case studies presented in this publication go one step further and specify empirically verifiable indicators that can be used for the identification of socio-economic and demographic issues, problems and opportunities in coastal and aquatic resources management and that can further be used for monitoring the impact of management measures on the socio-economic well-being of fishing communities. The guidelines also identify data sources and methods for collection of the data.

As women and men play different roles and are affected differently by management decisions, their special roles, interests and needs must be recognized and considered. For this reason, the information to be collected must be gender sensitive and gender-disaggregated.

It is hoped that the various stakeholders in fisheries and aquatic resource management – i.e. fisheries development agencies, fisherfolk cooperatives, women’s associations, fisheries and resource management councils and non-governmental organizations involved in fisheries and coastal resource management, will make use of the guidelines. It is also hoped that this will contribute to a better consideration of the problems faced by small-scale fishing communities and ultimately to a better contribution of these communities to food security and poverty alleviation.

Jeremy Turner
Chief, Fishery Technology Service
Fishery Industries Division
FAO Fisheries Department
PREPARATION OF THIS DOCUMENT

This document contains guidelines on the collection of demographic and socio-economic information on fishing communities for use in coastal and aquatic resources management in the Philippines (Part 1); the summary report of the Regional Workshop on the Use of Demographic Data in Fisheries and Coastal Development and Management in the Philippines and other Southeast and South Asian Countries held at the University of the Philippines in the Visayas, Miag-ao, Iloilo, Philippines from 18 to 21 March 2002 (Part 2); and case studies on the use of demographic and socio-economic data in coastal and aquatic resources management in the United States of America and in Italy (Part 3).

The guidelines and the workshop report were prepared by Ms Lolita V. Villareal, FAO Consultant. The case studies on the use of demographic and socio-economic data in coastal and aquatic resources management in the United States of America and in Italy were written by Mr Steve Tilley and Mr Franco Sibona, FAO Consultants, respectively.

This document draws on the findings of the interregional FAO–UNFPA project Strengthening of Research and Training on Population and Development Dynamics of Rural Fishing Communities published in FAO Fisheries Technical Paper No. 403 and in FAO Fisheries Reports Nos. 566 and 599. The document has been edited by Ms Virginia Kelleher, FAO Consultant, and by Dr Uwe Tietze, Fishery Industry Officer, FAO Rome.

ACKNOWLEDGEMENTS

The authors hereby express their gratitude to the University of the Philippines in the Visayas (UPV) for kindly organizing the regional workshop where the guidelines presented in this publication were discussed and country case studies on the use of socio-economic and demographic data in coastal and fisheries management and development were presented. The authors particularly acknowledge the contributions of Dr Ida Siason, Chancellor of UPV; Dr Leonor Santos, Director, Institute of Fisheries Policy and Development Studies, College of Fisheries and Ocean Sciences, UPV; Dr Purwito Martosubroto, Fishery Resources Division, FAO Rome; and the various resource persons from UPV; the Commission on Population (POPCOM) of the Philippines; the Bureau of Fisheries and Aquatic Resources (BFAR); the Provincial Planning and Development Offices of Zamboanga Sibugay, Pangasinan and Capiz province; the University of San Carlos, Cebu City; Bicol University, Albay; the National Economic Development Authority (NEDA); the Philippine Council for Aquatic and Marine Research and Development (PCAMRD); the German Agency for Technical Cooperation (GTZ); the International Center for Living Aquatic Resources Management (ICLARM); the United States Agency for International Development (USAID); the Southeast Asian Fisheries Development Centre (SEAFDEC); the Ministry of Livestock and Fisheries, Myanmar; the Department of Fisheries and Aquatic Resources, Sri Lanka; the Ministry of Agriculture and Cooperatives, Sri Lanka; and the Ministry of Fisheries, Viet Nam, all of whom participated in the workshop and whose contributions are reflected in this publication.

Distribution:
Directors of Fisheries
Fisheries Research and Training Institutes – English-speaking countries
Population Research and Training Institutes – English-speaking countries
NGOs
FAO Fisheries Field Projects
FAO Representatives
FAO Regional Fisheries Officers
Bilateral and Multilateral Development Agencies
ABSTRACT

Article 10 of the Code of Conduct for Responsible Fisheries (CCRF) sets out principles and standards for the integration of fisheries in coastal management. Article 10.2.4 of the CCRF states: “States, in accordance with their capacities, should establish or promote the establishment of systems to monitor the coastal environment as part of the coastal management process using physical, chemical, biological, economic and social parameters.”

The guidelines presented in Part 1 of this Fisheries Technical Paper attempt to identify empirically verifiable key indicators for the identification of socio-economic and demographic issues, problems and opportunities in coastal and aquatic resources management and for monitoring the impact of management measures on the socio-economic well-being of coastal and fishing communities. The guidelines also identify data sources and methods for the collection of data.

Part 2 contains a summary of the proceedings and recommendations of the Regional Workshop on the Use of Demographic Data in Fisheries and Coastal Development and Management in the Philippines and other Southeast and South Asian Countries held at the University of the Philippines in the Visayas, Miag-ao, Iloilo, Philippines from 18 to 21 March 2002, as well as selected papers from the workshop.

In Part 3, two case studies, one from the United States of America and the other from Italy, describe how socio-economic and demographic indicators are actually used in coastal and aquatic resources management.
**Contents**

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABBREVIATIONS AND ACRONYMS</td>
<td>xi</td>
</tr>
<tr>
<td>INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>PART 1</td>
<td>3</td>
</tr>
<tr>
<td>GUIDELINES ON THE COLLECTION OF DEMOGRAPHIC AND SOCIO-ECONOMIC INFORMATION ON FISHING COMMUNITIES IN THE PHILIPPINES</td>
<td></td>
</tr>
<tr>
<td>1. PURPOSE OF THE GUIDELINES</td>
<td>3</td>
</tr>
<tr>
<td>2. BACKGROUND AND OVERVIEW</td>
<td>3</td>
</tr>
<tr>
<td>2.1 Fisheries profile</td>
<td>3</td>
</tr>
<tr>
<td>2.2 State of the Philippine population</td>
<td>4</td>
</tr>
<tr>
<td>2.3 Municipal fisherfolk population</td>
<td>4</td>
</tr>
<tr>
<td>2.4 State of the resource</td>
<td>5</td>
</tr>
<tr>
<td>2.5 Coastal Resource Management Programmes (CRMP)</td>
<td>5</td>
</tr>
<tr>
<td>3. SOCIO-ECONOMIC AND DEMOGRAPHIC SYSTEMS: A FRAMEWORK</td>
<td>6</td>
</tr>
<tr>
<td>3.1 Macro level</td>
<td>6</td>
</tr>
<tr>
<td>3.2 Micro/project level</td>
<td>6</td>
</tr>
<tr>
<td>4. SOCIO-ECONOMIC AND DEMOGRAPHIC CHARACTERISTICS AND INDICATORS</td>
<td>8</td>
</tr>
<tr>
<td>4.1 Coastal resource management planning process</td>
<td>9</td>
</tr>
<tr>
<td>4.2 Data needs and information requirements</td>
<td>9</td>
</tr>
<tr>
<td>4.3 Data collection</td>
<td>10</td>
</tr>
<tr>
<td>4.4 Household and individual questionnaires</td>
<td>21</td>
</tr>
<tr>
<td>4.5 Data processing and maintenance</td>
<td>24</td>
</tr>
<tr>
<td>REFERENCES</td>
<td>26</td>
</tr>
<tr>
<td>Annex 1: LIST OF 109 POPDEV INDICATORS</td>
<td>29</td>
</tr>
<tr>
<td>Annex 2: GUIDELINES FOR FOCUS GROUP DISCUSSIONS</td>
<td>35</td>
</tr>
<tr>
<td>Annex 3: SOCIO-ECONOMIC AND DEMOGRAPHIC PROFILE QUESTIONNAIRE: HEAD OF HOUSEHOLD SCHEDULE</td>
<td>37</td>
</tr>
<tr>
<td>Annex 4: SOCIO-ECONOMIC AND DEMOGRAPHIC PROFILE QUESTIONNAIRE: INDIVIDUAL SCHEDULE</td>
<td>43</td>
</tr>
<tr>
<td>PART 2</td>
<td>47</td>
</tr>
<tr>
<td>SUMMARY OF PROCEEDINGS AND RECOMMENDATIONS OF THE REGIONAL WORKSHOP ON THE USE OF DEMOGRAPHIC DATA IN FISHERIES AND COASTAL DEVELOPMENT AND MANAGEMENT IN THE PHILIPPINES AND OTHER SOUTHEAST AND SOUTH ASIAN COUNTRIES</td>
<td></td>
</tr>
</tbody>
</table>
1. BACKGROUND, PURPOSE AND PARTICIPATION 47

2. PROCEEDINGS 47
   2.1 Opening ceremony 48
   2.2 Present and future role of the College of Fisheries and Ocean Sciences in fisheries and coastal resource management 48
   2.3 Status of coastal fisheries management in South and Southeast Asia: the need for management planning and the FAO Technical guidelines for responsible fisheries No. 3: Integration of fisheries into coastal area management 49
   2.4 Demographic change in coastal fishing communities and its implications for the coastal environment 49
   2.5 The use of demographic data in fisheries and coastal management and development policies and programmes 50
   2.6 Some observations and challenges for action from a multilateral agency 54

3. DISCUSSION AND ADOPTION OF WORKSHOP RECOMMENDATIONS 54

Annex 1: PROGRAMME 59
Annex 2: LIST OF PARTICIPANTS 63
Annex 3: SELECTED PAPERS PRESENTED 67

PAPER 1

PRESENT AND FUTURE ROLE OF THE COLLEGE OF FISHERIES AND OCEAN SCIENCES IN FISHERIES AND COASTAL RESOURCE MANAGEMENT
by Glenn D. Aguilar 69

1. INTRODUCTION 69

2. FISHERIES AND COASTAL RESOURCE MANAGEMENT IN THE PHILIPPINES 70
   2.1 Fish production and balance of trade 70
   2.2 Domestic demand 71
   2.3 Fisheries contribution to the Philippine economy 71
   2.4 Coastal resource management concerns 72

3. THE UP VISAYAS COLLEGE OF FISHERIES AND OCEAN SCIENCES 73
   3.1 Instruction 75
   3.2 Research 76
   3.3 Extension 76

4. THE ROLE OF THE COLLEGE OF FISHERIES AND OCEAN SCIENCES 77
   4.1 Continuation of its work 77
   4.2 Providing expertise and leadership 77
   4.3 Self-sustaining operations 77
   4.4 Basic research and development of appropriate technologies 77
   4.5 Improved delivery of research findings 78

5. CONCLUSION 78

REFERENCES 79
PAPER 2

FISHERIES AND COASTAL RESOURCE MANAGEMENT IN THE PHILIPPINES by Jessica C. Muñoz 81

1. INTRODUCTION 81

2. STATUS OF COASTAL HABITATS AND FISHERIES RESOURCES 81
   2.1 Coral reefs 81
   2.2 Mangrove communities 82
   2.3 Seagrass 82
   2.4 Seaweeds 82
   2.5 Fisheries 82

3. SOCIO-ECONOMIC CONDITIONS AND DEMOGRAPHICS 82

4. FISHERIES AND COASTAL MANAGEMENT POLICIES: THE LEGAL FRAMEWORK 83
   4.1 The Local Government Code of 1991 (RA 7160) 83
   4.2 The Fisheries Code of 1998 (RA 8550) 84
   4.3 The Agriculture and Fishery Modernization Act of 1997 (AFMA, RA 8435) 85
   4.4 International treaties 86
   4.5 Multilateral agreements 87

5. FISHERIES AND COASTAL MANAGEMENT INTERVENTIONS AND STRATEGIES 87
   5.1 Coastal and Fisheries Management Programmes 87
   5.2 Management interventions 90
   5.3 Information, Education and Communication (IEC) 91
   5.4 Marine and fisheries research 91

6. COMMUNITY-BASED RESOURCE MANAGEMENT OR CO-MANAGEMENT AS AN APPROACH TO FISHERIES MANAGEMENT 92
   6.1 Community organizing 92
   6.2 Income diversification 93
   6.3 Capability building 93

7. AGENCIES AND INSTITUTIONAL ARRANGEMENTS 93

8. CHALLENGES IN FISHERIES AND COASTAL RESOURCE MANAGEMENT 94

REFERENCES 96
CASE STUDIES ON THE USE OF DEMOGRAPHIC AND SOCIO-ECONOMIC INDICATORS IN COASTAL MANAGEMENT

CASE STUDY 1

USE OF SOCIO-ECONOMIC AND DEMOGRAPHIC INFORMATION FOR COASTAL MANAGEMENT IN PUGET SOUND, WASHINGTON STATE, USA by Steve Tilley

1. INTRODUCTION

2. GROWTH MANAGEMENT BENCHMARKS
   2.1 Population growth
   2.2 Growth management benchmarks

3. PUGET SOUND SHELLFISH HARVEST

4. WEST COAST GROUNDFISH FLEET RESTRUCTURING PROJECT

5. CONCLUSION

REFERENCES

CASE STUDY 2

REGIONAL COASTAL PLANNING AND MANAGEMENT IN THE LIGURIA REGION OF ITALY by Franco Sibona

1. INTRODUCTION

2. FISHERY AND AQUACULTURE

3. REGIONAL COASTAL PLANNING AND MANAGEMENT

4. USE OF DEMOGRAPHIC AND SOCIO-ECONOMIC INDICATORS IN REGIONAL COASTAL PLANNING AND MANAGEMENT

5. AN EXAMPLE FOR LOCAL COASTAL PLANNING: THE MUNICIPALITY OF VERNAZZA
   5.1 Key indicators
   5.2 Demographic and social problems
   5.3 Activities proposed to improve the situation
# ABBREVIATIONS AND ACRONYMS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADB</td>
<td>Asian Development Bank</td>
</tr>
<tr>
<td>BFAR</td>
<td>Bureau of Fisheries and Aquatic Resources</td>
</tr>
<tr>
<td>BHWS</td>
<td>Barangay Health Workers</td>
</tr>
<tr>
<td>BSPOs</td>
<td>Barangay Service Point Officers</td>
</tr>
<tr>
<td>CB-CRM</td>
<td>Community-Based Coastal Resource Management</td>
</tr>
<tr>
<td>CBOs</td>
<td>Community-Based Organizations</td>
</tr>
<tr>
<td>CCRF</td>
<td>Code of Conduct for Responsible Fisheries</td>
</tr>
<tr>
<td>CEP</td>
<td>Coastal Environment Programme</td>
</tr>
<tr>
<td>CERDAF</td>
<td>Committee on Extension, Research and Development for Agriculture and Fisheries</td>
</tr>
<tr>
<td>CFOS</td>
<td>College of Fisheries and Ocean Sciences</td>
</tr>
<tr>
<td>CLET</td>
<td>Composite Law Enforcement Teams</td>
</tr>
<tr>
<td>CO</td>
<td>Community Organizing</td>
</tr>
<tr>
<td>CPH</td>
<td>Census of Population and Housing</td>
</tr>
<tr>
<td>CPR</td>
<td>Community Property Rights</td>
</tr>
<tr>
<td>CRM</td>
<td>Coastal Resource Management</td>
</tr>
<tr>
<td>CRMP</td>
<td>Coastal Resource Management Programme</td>
</tr>
<tr>
<td>CVRP</td>
<td>Central Visayas Regional Project</td>
</tr>
<tr>
<td>DA</td>
<td>Department of Agriculture</td>
</tr>
<tr>
<td>DENR</td>
<td>Department of Environment and Natural Resources</td>
</tr>
<tr>
<td>DILG</td>
<td>Department of the Interior and Local Government</td>
</tr>
<tr>
<td>DOF</td>
<td>Department of Fisheries</td>
</tr>
<tr>
<td>DOH</td>
<td>Department of Health</td>
</tr>
<tr>
<td>DOST</td>
<td>Department of Science and Technology</td>
</tr>
<tr>
<td>EEZ</td>
<td>Exclusive Economic Zone</td>
</tr>
<tr>
<td>FARMCS</td>
<td>Fisheries and Aquatic Resource Management Councils</td>
</tr>
<tr>
<td>FAs</td>
<td>Fishers’ Associations</td>
</tr>
<tr>
<td>FCs</td>
<td>Fisheries Cooperatives</td>
</tr>
<tr>
<td>FIES</td>
<td>Family Income and Expenditure Survey</td>
</tr>
<tr>
<td>FLEMS</td>
<td>Functional Literacy, Education and Mass Media Survey</td>
</tr>
<tr>
<td>FRMP</td>
<td>Fisheries Resource Management Project</td>
</tr>
<tr>
<td>FSP</td>
<td>Fisheries Sector Programme</td>
</tr>
<tr>
<td>GFR</td>
<td>Groundfish Fleet Restructuring Information and Analysis Project</td>
</tr>
<tr>
<td>GMA</td>
<td>Growth Management Act</td>
</tr>
<tr>
<td>ICLARM</td>
<td>International Center for Living Aquatic Resources Management</td>
</tr>
<tr>
<td>IEC</td>
<td>Information, Education and Communication</td>
</tr>
<tr>
<td>LFS</td>
<td>Labour Force Survey</td>
</tr>
<tr>
<td>LGC</td>
<td>Local Government Code</td>
</tr>
<tr>
<td>LGUs</td>
<td>Local Government Units</td>
</tr>
<tr>
<td>MCEPs</td>
<td>Municipal Coastal Environmental Profiles</td>
</tr>
<tr>
<td>MFO</td>
<td>Municipal Fisheries Ordinance</td>
</tr>
<tr>
<td>MHLRC</td>
<td>Multilateral High Level Conference</td>
</tr>
<tr>
<td>MMA</td>
<td>Master of Marine Affairs</td>
</tr>
<tr>
<td>MMAP</td>
<td>Master of Marine Affairs Programme</td>
</tr>
<tr>
<td>MMFO</td>
<td>Model Municipal Fisheries Ordinance</td>
</tr>
<tr>
<td>MPAs</td>
<td>Marine Protected Areas</td>
</tr>
<tr>
<td>MPDOs</td>
<td>Municipal Planning and Development Officers</td>
</tr>
<tr>
<td>MSOS</td>
<td>Master of Science in Ocean Science</td>
</tr>
<tr>
<td>MSY</td>
<td>Maximum Sustainable Yield</td>
</tr>
<tr>
<td>NDS</td>
<td>National Demographic Survey</td>
</tr>
<tr>
<td>NEDA</td>
<td>National Economic Development Authority</td>
</tr>
<tr>
<td>NFARMC</td>
<td>National Fisheries and Aquatic Resource Management Council</td>
</tr>
<tr>
<td>NGOs</td>
<td>Non-Government Organizations</td>
</tr>
<tr>
<td>NSCB</td>
<td>National Statistical Coordination Board</td>
</tr>
<tr>
<td>NSO</td>
<td>National Statistics Office</td>
</tr>
<tr>
<td>PAO</td>
<td>Provincial Agriculture Office</td>
</tr>
<tr>
<td>Acronym</td>
<td>Full Form</td>
</tr>
<tr>
<td>----------</td>
<td>---------------------------------------------------</td>
</tr>
<tr>
<td>PCAMRD</td>
<td>Philippine Council for Aquatic and Marine Research and Development</td>
</tr>
<tr>
<td>PCG</td>
<td>Philippine Coast Guard</td>
</tr>
<tr>
<td>PCSD</td>
<td>Philippine Council for Sustainable Development</td>
</tr>
<tr>
<td>PFMC</td>
<td>Pacific Fishery Management Council</td>
</tr>
<tr>
<td>PhilFIS</td>
<td>Philippine Fisheries Information System</td>
</tr>
<tr>
<td>PMC</td>
<td>Programme Management Centre</td>
</tr>
<tr>
<td>POPCEN</td>
<td>Population Census</td>
</tr>
<tr>
<td>POPCOM</td>
<td>Commission on Population</td>
</tr>
<tr>
<td>POPDEV</td>
<td>Population–Development</td>
</tr>
<tr>
<td>Pos</td>
<td>People’s Organizations</td>
</tr>
<tr>
<td>RDE</td>
<td>Research, Development and Extension</td>
</tr>
<tr>
<td>REAs</td>
<td>Resource and Ecological Assessments</td>
</tr>
<tr>
<td>RIFTs</td>
<td>Regional Institutes of Fisheries Technology</td>
</tr>
<tr>
<td>RSA</td>
<td>Resource and Social Assessment</td>
</tr>
<tr>
<td>SEAFDEC</td>
<td>Southeast Asian Fisheries Development Center</td>
</tr>
<tr>
<td>SUCs</td>
<td>State Universities and Colleges</td>
</tr>
<tr>
<td>TAC</td>
<td>Total Allowable Catch</td>
</tr>
<tr>
<td>TWG</td>
<td>Technical Working Group</td>
</tr>
<tr>
<td>UNCED</td>
<td>United Nations Conference on Environment and Development</td>
</tr>
<tr>
<td>UNEP</td>
<td>United Nations Environment Programme</td>
</tr>
<tr>
<td>UPV</td>
<td>University of the Philippines in the Visayas</td>
</tr>
<tr>
<td>USAID</td>
<td>United States Agency for International Development</td>
</tr>
<tr>
<td>VisSea</td>
<td>Visayan Sea Coastal and Fisheries Resources Management Project</td>
</tr>
</tbody>
</table>
Rational fisheries management and planning requires a comprehensive and thorough understanding of the social, cultural, demographic and economic situation in a particular area. If the design and implementation of fisheries development policies are to create a positive impact and benefit fisherfolk and other coastal communities, the interactions between demographic change and the socio-economic development of fishing communities and between these two processes and the natural environment must be understood and appreciated. This necessitates accurate, timely, relevant and accessible data.

While data on fish production, fish stocks, vessels and gears is regularly collected, the collection of socio-economic and demographic data has been deficient, sporadic and incidental.

Article 10 of the Code of Conduct for Responsible Fisheries sets out principles and standards for the integration of fisheries into coastal area management. As per Article 10.2.4 of the Code of Conduct:

“States, in accordance with their capacities, should establish or promote the establishment of systems to monitor the coastal environment as part of the coastal management process using physical, chemical, biological, economic and social parameters.”

To elaborate on Article 10.2.4 in greater detail, FAO published Technical guidelines for responsible fisheries no. 3: Integration of fisheries into coastal area management. On page 13 (Box 5) of the Technical Guidelines, the economic and social parameters mentioned in the Code of Conduct are specified as “population density, employment and unemployment, income levels, regional GDP, barriers to entry and exit of main occupations, resource allocation systems, occurrence of social conflict, levels of subsidy in different sectors.”

The parameters listed in the Technical Guidelines are, however, still too general to guide the actual collection of data and information at country level.

Recognizing the need to take the Technical Guidelines one step further, this document presents practical guidelines on the collection of demographic and socio-economic information on fishing communities, and identifies empirically verifiable indicators that can be used for the identification of socio-economic and demographic issues, problems and opportunities in coastal and aquatic resources management. The indicators can further be used for monitoring the impact of management measures on the socio-economic well-being of coastal communities. These guidelines also attempt to identify data sources and methods for data collection.

To be pragmatic, the guidelines use the example of a particular country – the Philippines. Despite the specific reference to the Philippines, the guidelines presented in this technical paper are relevant and applicable to other Southeast Asian and South Asian countries.

This technical paper draws on the results and findings of a regional project executed by the Food and Agriculture Organization of the United Nations and funded by the United Nations Population Fund titled Strengthening of Research and Training on Population and Development Dynamics of Rural Fishing Communities. Implemented from 1995 to 1999 in six countries in Asia and Africa, the regional project aimed at answering the need to create awareness and increase knowledge of population and demographic issues in coastal fishing communities among the various stakeholders (i.e. fishery policy makers, research institutions, government fisheries development agencies, non-government organizations, fisherfolk associations and concerned local government bodies). The objective was to enhance the capacity of the stakeholders to integrate population and demographic concerns into research and educational programmes as well as into community-based fisheries management and integrated coastal area management programmes.

More specifically, macro- and micro-level surveys were carried out to improve the understanding of the socio-demographic characteristics of fisherfolk, their perception of and relationship to population factors, the level of exploitation of fisheries

---

1 Representing four subregions in Asia and Africa, the six participating countries were the Philippines, Malaysia, India, Bangladesh, Tanzania and Senegal.
resources and the state of the coastal environment. Findings of the project were published in FAO Fisheries Technical Paper No. 403 and in FAO Fisheries Report Nos. 566 and 599.

For the Philippines, the project had two outcomes: (1) conduct of a national level study on demographic change and a comparative analysis between two fishing communities and one farming community in Miag-ao, Iloilo Province; and (2) development of curriculum elements/training materials for use in training programmes and in the Master of Marine Affairs Programme of the College of Fisheries and Ocean Sciences in the University of the Philippines in the Visayas (UPV).2

The guidelines contained in this document and case studies from Southeast and South Asian countries were presented and discussed in the Regional Workshop on the Use of Demographic Data in Fisheries and Coastal Development and Management in the Philippines and other Southeast and South Asian Countries held at the University of the Philippines in the Visayas, Miag-ao, Iloilo, Philippines from 18 to 21 March 2002.

The regional workshop was attended by local experts from the University of the Philippines in the Visayas, the University of San Carlos, Bicol University, the Bureau of Fisheries and Aquatic Resources, the Commission on Population, local government units and other agencies involved in the development and management of coastal resources in the Philippines. Foreign participation included experts from the Food and Agriculture Organization of the United Nations, resource persons from other Southeast and South Asian countries such as Myanmar, Thailand, Viet Nam and Sri Lanka, and observers from international multilateral and bilateral development agencies.

Part 2 of this technical paper contains a summary of the workshop’s proceedings and recommendations as well as selected papers from the workshop.

Part 3 contains two case studies from developed countries – Italy and the United States of America, on the use of demographic data in coastal management.

---

2 The College of Fisheries and Ocean Sciences in the University of the Philippines in the Visayas (UPV) was the participating institution for the Philippines and served as the focal point for the conduct of the research.
Part 1

Guidelines on the collection of demographic and socio-economic information on fishing communities in the Philippines

1. PURPOSE OF THE GUIDELINES

Effective fisheries planning and management, particularly community-based coastal resource management, requires a sound knowledge of the socio-demographic characteristics of fishing communities. It is important that the social and economic well-being of coastal fisherfolk – both men and women – be taken into consideration when making management decisions. As a management tool, the guidelines presented in this document provide a general framework that can be used to identify and monitor those social and demographic characteristics that affect the status of fisheries and aquatic resources and the coastal environment, and/or that are affected by management decisions.

As an information tool, the guidelines serve to strengthen the collection, analysis and dissemination of basic information on socio-economic and demographic characteristics of fishing communities, thus enabling deeper insights into fisherfolk’s attitudes and perceptions and how they relate to and impact on the status and utilization of fisheries resources. Recognizing that men and women play distinctive yet complementary roles and are affected differently by management decisions, the guidelines point to the collection of gender-disaggregated information where possible.

The use of these guidelines on a regular basis will facilitate comparative analyses of socio-demographic characteristics across time and space, allowing the determination of trends and identification of appropriate actions.

These guidelines have been developed for the various stakeholders in fisheries and aquatic resource management. These stakeholders include fisheries development agencies at the national and local levels, fishers cooperatives, women’s associations, fisheries and resource management councils, and non-government organizations (NGOs) involved in fisheries and coastal resource management. Through these guidelines, it is hoped to create increased awareness of the need to incorporate a population and development perspective as well as gender concerns in the process of integrating demographic components in fisheries planning and management among the various stakeholders.

It is also expected that the College of Fisheries and Ocean Sciences of the University of the Philippines in the Visayas (UPV) will use these guidelines as teaching material in the recently introduced course on social and demographic characteristics of coastal fishing communities, which forms part of their Master in Marine Affairs Programme.

2. BACKGROUND AND OVERVIEW

2.1 Fisheries profile

Philippine fisheries production comes from three major sources: (a) municipal fisheries (fishing in coastal and inland waters with or without the use of fishing boats of up to three gross tons); (b) commercial fisheries (fishing with the use of fishing vessels of more than three gross tons); and (c) aquaculture (production from fishponds, fish pens and fish cages in fresh, brackish or marine waters and mariculture of oyster, mussel and seaweeds).

From Philippine fisheries profile (BFAR, 1999).
Total fish production in 1999 was 2.82 million metric tonnes. Table 1 presents the quantity and value of total fish production by sector. Globally, the Philippines ranked fourteenth among the top fish producing countries in 1997.

<table>
<thead>
<tr>
<th></th>
<th>Quantity</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(100 MT)</td>
<td>(%)</td>
</tr>
<tr>
<td>Aquaculture</td>
<td>949</td>
<td>34.4</td>
</tr>
<tr>
<td>Municipal Fisheries</td>
<td>919</td>
<td>32.3</td>
</tr>
<tr>
<td>Commercial Fisheries</td>
<td>948</td>
<td>33.3</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>2,816</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

The fisheries industry provides a significant contribution to the country’s economy. In 1999, it contributed 2.7 percent at current prices to the country’s Gross Domestic Product and accounted for 15.0 percent of the Gross Value Added (GVA) from the Agriculture, Fisheries and Forestry sector. Overall, the fisheries sector is second only to the agriculture sector in terms of its contribution to GVA.

Total fishery exports were valued at US$480 million compared to fishery imports of only US$107.3 million. Tuna was the top dollar earner, followed by shrimp/prawn and seaweeds.

2.2 State of the Philippine population

The Philippines is the thirteenth most populous country in the world. In 2000, the Philippines registered a population of 75.33 million and an annual growth rate of 2.02 percent. While the average growth rates have been declining (2.75 percent in 1980, 2.35 percent in 1990 and 2.32 percent in 1995), population concerns that demand appropriate response and intervention still exist. According to the Commission on Population (POPCOM), the continued momentum of rapid population growth will translate to a population increase in absolute numbers for the next two decades, declines in population growth rates notwithstanding. Citing the 1998 National Demographic and Health Survey, POPCOM underscores the following findings:

1. The actual fertility rate of 3.7 children is higher than the wanted fertility rate of 2.7 children.
2. There is a high unmet need for contraception of 19 percent.

3. Substantial differences in the overall levels of contraceptive use between poor and non-poor women exist.
4. Husbands generally prefer higher fertility than their wives and non-use of contraception is related to ‘husband’s objection’.

Based on the results of the household survey conducted by UPV, these findings have relevance to fishing communities.

The basic Philippine population policy gives couples the responsibility to decide how many children to have in accordance with their religious beliefs and the demands of responsible parenthood for sustainable development. The policy focuses on: (1) helping couples achieve their desired family size; (2) improving the reproductive health of individuals and contributing to a further reduction of infant mortality, maternal mortality and early child mortality; (3) reducing the incidence of teenage pregnancy and early marriage; and (4) contributing to policies that will assist government achieve a favourable balance between population distribution and economic activities. As a strategy, the empowerment of men and women – especially of women – and the improvement of their political, social, economic and health status are pursued.

2.3 Municipal fisherfolk population

In total, coastal communities comprise about 54 percent of all municipalities in the country. The social relevance of the municipal fisheries sector is highlighted because fishing communities are often poor, geographically isolated and have little access to basic social services. They have also been characterized as high fertility groups.

There is no accurate account of the actual number of people dependent on and involved in the fisheries industry. It has always been estimated that more than one million persons are engaged directly and indirectly in fishery-related activities. Of this, municipal fisherfolk occupy a clear majority. A desk study conducted by Baylon (1997) on the population trends of municipal fisherfolk reports that the total municipal fisherfolk population increased from 399,942 in 1970 to 904,004 in 1980 – an increase of 126 percent. This large increase suggests that fishing still attracted labour from other sectors and was providing a good source of income. Between 1980 and 1990, total municipal fisherfolk population
registered a slight increase of only 6 percent, indicating a decreasing attractiveness of the fisheries sector. Overexploitation and depletion of the resource were cited as possible factors for the decline.

2.4 State of the resource
A critical issue facing the fisheries sector is the sustainability of fishery resources. Fishery experts have recognized that the limits of sustainable fishing have already been reached or even exceeded. The open access regime has resulted in overexploitation. Habitat destruction, particularly of coral reefs, mangroves and seagrass areas, exacerbates the problem. These have resulted in a leveling off or declining fish catches, ultimately translating to reduced incomes for fishers. The mutually reinforcing issues of resource depletion and persistent poverty have relegated the small-scale fisherfolk to being among the most economically and socially disadvantaged groups in Philippine society.

2.5 Coastal Resource Management Programmes (CRMP)
Increasing awareness of the endangered state of the coastal environment has resulted in a shift of focus from fisheries development to coastal resource management (CRM), in the decentralization and devolution of fisheries management to local government units and in the active participation of the affected communities. As a result, community-based coastal resource management (CB-CRM) programmes and projects have been promoted and are being implemented in various stages and modalities within the country.

As an approach to sustainable development, CB-CRM aims at the protection, rehabilitation and regeneration of degraded coastal areas to benefit coastal communities. CB-CRM uses an integrated approach that considers the interrelationships and interdependencies of the biological, physical, socio-cultural, economic, demographic, legal and institutional factors obtaining in the coastal area. Studies and experience have shown that the key to success of any CRM initiative is the active involvement and participation of the community. CB-CRM is premised on community accountability and responsibility.

2.5.1 Local Government Code (LGC) of 1991
The Local Government Code (LGC) of 1991 (RA 7160) devolves certain responsibilities for fishery resources and powers for their management to local governments. The Code gives local governments the mandate to manage municipal waters within a distance from the coast of 15 kilometres seaward, and to enact and enforce appropriate fishery ordinances. Joint undertakings with non-government organizations, people’s organizations and other stakeholders for the promotion of ecological balance are also encouraged and promoted by the Code.

In May 1999, a conference attended by more than 700 mayors representing 90 percent of the coastal communities was held in Manila. The conference was an initiative of the Coastal Resource Management Project funded by the United States Agency for International Development (USAID), and the League of Municipal Mayors of the Philippines. Its aim was to bring to the attention of policy-makers the urgent call for government to promote, as a basic service to coastal communities, coastal resource management. An output of the conference was a 15-point set of resolutions requiring executive and legislative actions that would enable local government units (LGUs) to effectively manage their municipal waters.

2.5.2 Fisheries and Aquatic Resource Management Councils (FARMCs)
The passage of the Philippine Fisheries Code of 1998 (RA 8550) mandated the creation of Fisheries and Aquatic Resource Management Councils (FARMCs) in all cities/municipalities abutting municipal waters. FARMCs institutionalise the role of local fisherfolk and resource users in the planning and implementation of policies and programmes for the management, conservation, development and protection of fisheries resources.

In an advisory capacity, FARMCs assist Municipal Development Councils in the preparation of their respective municipal fisheries development plans. FARMCs, through their respective Committees on Fisheries, also recommend the enactment of municipal fishery ordinances to the Sangguniang Bayan and assist in the enforcement of fishery laws, rules and regulations in municipal waters.

At the municipal level, the regular members of the FARMCs comprise the following:
- municipal planning and development officer
- chairperson of the Agriculture/Fishery Committee of the Sangguniang Bayan
- representative of the Municipal Development Council
- representative from the accredited non-government organization
representative from the private sector
representative from the Department of Agriculture
at least 11 fisherfolk representatives (seven fisherfolk, one fishworker, three commercial fishers) that include representatives from the youth and women sectors.

Organization of the FARMCs went full steam with the approval in March 2000 of the guidelines for FARMC implementation. By the end of 2000, a total of 864 municipalities and cities, representing 85 percent of the total reported coastal municipalities and cities in the country, had FARMCs organized. While optional at barangay level, a total of 6,244 barangay FARMCs (64 percent of total barangays) had also been organized.

At national level, the National FARMC serves as an advisory body to the Department of Agriculture. A National FARMC Programme Management Centre (PMC) based at the BFAR Central Office serves as the Secretariat. The PMC has reported that many of the FARMCs had been successful in influencing local legislative bodies into enacting their proposed municipal fishery ordinances and that these are now in various stages of implementation. The LGUs have also found that province-led law enforcement task forces are effective partners in policing municipal waters. Various projects on habitat conservation and protection have been identified and implemented. However, inadequate funding, lack of patrol boats and low capabilities for law enforcement have been identified as major obstacles in the implementation of FARMC recommendations.

3. SOCIO-ECONOMIC AND DEMOGRAPHIC SYSTEMS: A FRAMEWORK

This chapter highlights the salient features of population–development relationships and provides the contextual background for the succeeding discussion on identifying and monitoring socio-economic and demographic characteristics of fishing communities.

3.1 Macro level

The familiar argument that rapid population growth has an impact on socio-economic development and vice-versa can be better appreciated through the population–development (POPDEV) framework. This framework underscores the interrelationships between and among population and development variables (i.e. demographic processes affecting socio-economic outcomes and socio-economic processes affecting demographic outcomes).

The general framework presented in Figure 1 draws attention to the interaction between population factors and development factors in terms of processes and outcomes. Because of such interactions, one can start at any point to analyse population–development relationships: Population processes lead to development outcomes and vice-versa; development processes eventually affect population outcomes and vice-versa. The implication of this framework is that any policy formulated to achieve desired development objectives – be it a development or population policy – will impact on both population and development processes.

To illustrate, in Figure 2 the demographic processes of fertility, mortality and migration lead to the outcomes of population size, age–sex structure and the spatial distribution of the population. These demographic outcomes impact on development processes such as the consumption of goods and services, savings and investment behaviour, the utilization of human, physical and natural resources, etc. These development processes, in turn, lead to development outcomes, which can be expressed in terms of income or its distribution, levels of employment, educational status, health and nutritional status, environmental quality and which might be affected by extensive and overexploitation of natural resources. These socio-economic outcomes, in turn, alter the population processes of fertility, mortality and migration – the starting point of this illustration.

3.2 Micro/project level

At the micro/project level, development policies and strategies are translated more concretely into programmes and projects that directly affect specific populations.

A framework for population–development integration at the micro level is shown in Figure 3. A specific project on fishery resource management currently being implemented in the Philippines is used as an illustrative example. The target population groups are the municipal fishing communities where a set of project interventions development projects of NEDA such as the Population and Development Planning and Research Project (1980-1989), the Integrated Population and Development Planning Project and, more recently, the POPDEV Planning at the Local Level Project.
and activities are being introduced with the objective of reversing resource depletion in municipal waters.

The attainment of the project objective and goals will depend to a large extent on the population–development interactions at the community and household levels. Figure 4 expands the framework in Figure 3 to show how specific interactions between demographic and socio-economic factors at the household level can be analysed.

There are three major elements in the micro/project framework:

(a) the household decision-making model

The household decision-making model outlines the different decisions a household makes, and how such decisions are shaped by and dependent on household characteristics, the community environment and other external factors.

(b) the community environment

The community environment includes the physical, social and economic factors that are usually outside the household’s control, but which affect the household as factors and objects of production. An important element is the social structure and organization of the community, i.e. whether members of the community work together for the common good or for themselves alone. This is especially critical in community-based coastal resource management programmes, as the success
of such programmes is premised on community participation, responsibility and accountability.

(c) other sources of change

Other sources of change are external factors that indirectly affect the household by directly affecting other factors in the community.

As a planning and management tool, the POPDEV framework provides the planner with a better understanding of how household decision-making is influenced by the interaction of factors at the household and the community levels, as well as by other external factors. Such appreciation of the interactions and interrelationships among the variables enables the planner to analyse projects intended to benefit households or the community in their proper context.

4. SOCIO-ECONOMIC AND DEMOGRAPHIC CHARACTERISTICS AND INDICATORS

The POPDEV framework presented in the preceding chapter shows that population changes

---

**FIGURE 3**
Framework for population–development integration at the micro level: Fisheries Resource Management Project

<table>
<thead>
<tr>
<th>PROJECT ACTIVITIES</th>
<th>POPULATION–DEVELOPMENT INTERACTIONS</th>
<th>PROJECT OBJECTIVES</th>
</tr>
</thead>
</table>
| Fisheries resource management, fisheries information system, CRM planning and implementation, fisheries legislation and regulation, fisheries law enforcement, Income diversification, cooperative development, microenterprise development, mariculture development, Capacity building, strengthens institutions, project management | External Factors → Household Characteristics → Household Decisions → Community Environment | Goal:  
- Long-term sustainable development in the fisheries sector  
- Poverty reduction among municipal fisherfolk  
Objective:  
- To reverse the trend of fisheries resource depletion in municipal waters |

Source: The framework is adapted from the Training module on integrated population and development planning (NEDA, 1993); contents of Project Activities and Project Objectives were taken from Memorandum of understanding between the Department of Agriculture and the Bank Loan Appraisal Mission regarding the Fisheries Resource Management Project (ADB, 1997).

---

**FIGURE 4**
Framework for analysing population–development interrelationships at the household level

Source: Training module on integrated population and development planning (NEDA, 1993)
affect practically all components of social and economic life, from a macro perspective down to the community level and ultimately the family and individual units. The system of interactions in the POPDEV framework provides the context for examining changes in socio-economic and demographic characteristics and variables.

This chapter focuses on identifying and monitoring socio-economic and demographic characteristics of fishing communities within the framework of coastal resource planning and management. In recognition of the different levels of planning that the target users of these guidelines will be involved in, this chapter, like the preceding chapter, begins with a macro perspective before narrowing down to a discussion at the micro/project level.

4.1 Coastal resource management planning process

Coastal resource management (CRM) is the process of planning, implementing and monitoring the sustainable use of coastal resources through community participation, collective action and sound decision making.6 As in any development planning process, it covers the four processes of plan formulation, implementation, monitoring and evaluation.

Specifically, CRM consists of the following cyclical steps: (a) develop the coastal area profile; (b) compile the information database for project indicators and planning; (c) prepare the management plan; (d) implement action plans, projects and enforcement; and (e) monitor and evaluate.

Steps (a), (b) and (c) comprise the plan formulation stage where baseline information is gathered to provide the basis for developing the management plan and to provide indicators for monitoring purposes.

A coastal area profile presents a variety of information required for effective decision-making and planning, including environmental and socio-economic information and the analysis of problems and opportunities for sustainable coastal development.7 The construction of a coastal area profile usually starts with the collection of secondary information and proceeds, if needed, with the gathering of primary data to fill gaps.8 An information database with the following elements is then established:

- environmental assessment – involves the identification and classification of habitats and resources found in the coastal area;
- socio-economic/demographic/cultural assessment – involves the gathering of information on demographic and other socio-economic and cultural factors;
- governance – involves understanding the institutional (both formal and non-formal, political and administrative) arrangements prevailing in the coastal area; and
- resource use – involves consideration of the coastal area’s existing resource base.9

For purposes of these guidelines, the focus is on the socio-economic/demographic/cultural assessment element.

Monitoring the effectiveness of CRM plans requires the identification of indicators. Indicators are data or statistics that describe a person, a place or an event and the changes in them. They track the progress of activities towards the achievement of objectives, and are therefore important in guiding management decisions. Based on their use in the planning process, indicators can be categorized as process (input) or outcome (output) indicators, and as effect or impact indicators. Process or input indicators describe the past, present and expected future situation or condition of a locality and its people, and provide a benchmark for assessing how well objectives have been achieved. Outcome or output indicators measure the extent to which the needs or wants of target beneficiaries have been satisfied as a result of project interventions. Indicators can measure either short-run changes (effect indicators) or long-run changes (impact indicators).

The nature of CRM objectives and the resources available (i.e. budget and human resources availability), determine the type of indicators most appropriate to measure progress. Indicators must be relevant, simple, measurable, timely and cost-effective. Ultimately, the choice of indicators would depend on their availability and accessibility. Data from secondary sources may not be disaggregated at the level required and may be of limited value at the project level. Primary data collection may need to be conducted to cover the relevant information gaps.

4.2 Data needs and information requirements

Indicators can also be categorized according to the type of information they provide. Demographic indicators provide information on demographic processes and

---

7 Walters et al., 1998.
8 The Fishery Resource Management Project being implemented by BFAR with funding assistance from the ADB, prepares a Municipal Coastal Environmental Profile (MCEP) for its target municipalities. It makes use of the most recent available secondary data and, whenever funding permits, gathers primary data to update the profile. The BFAR regular project on the survey of coastal municipalities in the Philippines has also adopted the use of a profile.
their outcomes. Socio-economic indicators track economic progress and social change, and generally portray a people's state of well-being and quality of life. Indicators may be expressed as a proportion in relation to a given characteristic, rate of incidence, rate of change, mean, mode, median, percentage distribution or frequency distribution.

Through its UNFPA-funded project titled POPDEV Planning at the Local Level, the POPCOM commissioned the Statistical Research and Training Center to come up with a list of core indicators applying the framework presented in Figures 1–4 for population and development planning at the local level. The various indicator systems prepared by different national and sectoral groups were reviewed and integrated to produce (from a comprehensive list of 1,500 indicators) a recommended list of 109 core indicators. The POPDEV core indicators presented in Annex 1 cover both processes and outcomes. The use of the indicator system is primarily recommendatory, and the extent of its adoption would ultimately depend on the respective LGUs.

For purposes of monitoring socio-economic and demographic change in fishing communities, a number of core indicators has been selected from the recommend list. These are presented in Table 2 and serve as a 'shopping list' of available secondary data from which planners can choose, depending on their requirements and circumstances. This 'shopping list' is consistent with what is being promoted and institutionalised at the LGU level. To the extent possible, the indicators have been disaggregated by gender.

To provide uniformity and a standardized understanding of concepts and measures that are officially in use in government documents, Table 3 offers a definition, formula or interpretation for each core indicator. Table 3 also shows the data elements required, the agency/data source, the frequency of collection of the statistics and the lowest area domain for each indicator.

The core indicators presented in Table 3 are generic and can be used to monitor socio-economic and demographic changes in any particular area. The availability of these core indicators at the provincial level, however, limits their usefulness at the community level. To obtain the information required for community-based coastal resource planning and management, data gathering at the community, household and individual levels may have to be carried out.

### 4.3 Data collection

Once data needs have been identified, the process of data collection begins. Different methodologies may be used for primary data collection at the micro level, depending on the availability of resources. Survey methods such as censuses and sample surveys provide the most reliable information but require large amounts of time, money and human resources. Rapid participatory appraisal approaches require less resources and provide data which can be adequate for a particular planning purpose. One such methodology is the focus group discussion where respondents are convened to gather qualitative data, thus covering a representative sample given limited resources.

The FAO micro-level study conducted a participant appraisal research involving: (1) key informant interviews which obtained information on the socio-economic profile of the village, including its physical and institutional infrastructures and natural setting; and (2) focus group discussions which gathered information on perceptions, attitudes and practices regarding a range of topics such as socio-economic status, coastal environment, occupation, reproductive intentions and behaviour and decision-making.

Results of this participatory appraisal research served as inputs in the design of the questionnaire for the household sample survey.

At the household and individual levels, sample household surveys are the most appropriate method of obtaining information not available from secondary data sources. Depending on the type of information required, the sample may be selected randomly from the total population without any prior knowledge of particular characteristics, or through stratified random sampling whereby the population is first divided into categories on the basis of some predetermined characteristic(s) and a random sample is then taken from each category. In both cases, the sample size must be large enough to provide data that is statistically representative of the population. While the minimum sample size...
### TABLE 2
Selected process and outcome indicators for monitoring demographic and socio-economic characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Indicator</th>
<th>Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DEMOGRAPHIC</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fertility</td>
<td>▶ Crude birth rate</td>
<td>▶ Population growth rate</td>
</tr>
<tr>
<td></td>
<td>▶ Age-specific fertility rate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>▶ Total fertility rate</td>
<td></td>
</tr>
<tr>
<td>Mortality</td>
<td>▶ Crude death rate</td>
<td>▶ Sex ratio</td>
</tr>
<tr>
<td></td>
<td>▶ Life expectancy at birth, both sexes</td>
<td>▶ Percentage of population aged under 15, 15–64 and 65 years and over</td>
</tr>
<tr>
<td></td>
<td>▶ Infant mortality rate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>▶ Maternal mortality rate</td>
<td></td>
</tr>
<tr>
<td>Migration</td>
<td>▶ In-migration rate</td>
<td>▶ Average household size</td>
</tr>
<tr>
<td></td>
<td>▶ Out-migration rate</td>
<td>▶ Percentage of households by sex of head</td>
</tr>
<tr>
<td>Population size</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population structure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Household</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SOCIO-ECONOMIC</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Labour and employment</td>
<td>▶ Labour force participation rate, both sexes</td>
<td>▶ Unemployment rate, both sexes</td>
</tr>
<tr>
<td>Education</td>
<td>▶ Percentage of women/men by schooling completed</td>
<td>▶ Functional literacy rate, both sexes</td>
</tr>
<tr>
<td>Health and Sanitation</td>
<td>▶ Percentage of households availing of health care services</td>
<td></td>
</tr>
<tr>
<td></td>
<td>▶ Percentage of households with sanitary type of toilet facilities</td>
<td></td>
</tr>
<tr>
<td></td>
<td>▶ Percentage of households with safe main source of drinking water</td>
<td></td>
</tr>
<tr>
<td></td>
<td>▶ Percentage of households with owned/rented or shared house and/or lot</td>
<td></td>
</tr>
<tr>
<td>Housing and Household Convenience</td>
<td>▶ Percentage of households with house made of durable materials</td>
<td></td>
</tr>
<tr>
<td></td>
<td>▶ Percentage of households with electricity connection</td>
<td></td>
</tr>
<tr>
<td></td>
<td>▶ Percentage of households with household convenience</td>
<td></td>
</tr>
<tr>
<td>Family Planning</td>
<td>▶ Percentage of households with access to family planning services</td>
<td></td>
</tr>
<tr>
<td></td>
<td>▶ Contraceptive prevalence rate</td>
<td></td>
</tr>
<tr>
<td>Income</td>
<td></td>
<td>▶ Average family income</td>
</tr>
<tr>
<td></td>
<td></td>
<td>▶ Per capita income of households</td>
</tr>
</tbody>
</table>

Source: Extracted from *Core indicators for POPDEV planning at the local level* (Statistical Research and Training Centre, 1998)
### TABLE 3

**Definition, data elements and availability of selected core indicators**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Crude birth rate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Definition/Formula/Interpretation</strong></td>
<td>Number of live births per thousand population. Simplest and most common measure for comparing fertility levels of different areas.</td>
</tr>
</tbody>
</table>
| **Data Elements** | ▶ Number of live births in a given year  
▶ Mid-year population |
| **Agency/Data Source** | National Statistics Office (NSO)/National Demographic Survey (NDS) |
| **Frequency of Statistics** | Every five years |
| **Lowest Area Domain** | Province/City |

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Age-specific fertility rate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Definition/Formula/Interpretation</strong></td>
<td>Number of births occurring in a given year per thousand women of reproductive age (15–49 years) by 5-year age group.</td>
</tr>
</tbody>
</table>
| **Data Elements** | ▶ Number of live births in a given year by women aged 15–19 years, 20–24 years, 25–29 years, 30–34 years, 35–39 years, 40–44 years and 45–49 years  
▶ Mid-year female population by 5-year age group |
| **Agency/Data Source** | NSO/NDS |
| **Frequency of Statistics** | Every five years |
| **Lowest Area Domain** | Province/City |

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Total fertility rate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Definition/Formula/Interpretation</strong></td>
<td>Average number of children that would be born to a woman during her lifetime if she were to pass through her childbearing years conforming to the age-specific fertility rates of a given period. Measure of current fertility and unaffected by peculiarities in the age composition of women in their childbearing years.</td>
</tr>
<tr>
<td><strong>Data Elements</strong></td>
<td>Age-specific fertility rates</td>
</tr>
<tr>
<td><strong>Agency/Data Source</strong></td>
<td>NSO/NDS</td>
</tr>
<tr>
<td><strong>Frequency of Statistics</strong></td>
<td>Every five years</td>
</tr>
<tr>
<td><strong>Lowest Area Domain</strong></td>
<td>Province/City</td>
</tr>
</tbody>
</table>
### TABLE 3 (cont.)
**Definition, data elements and availability of selected core indicators**

<table>
<thead>
<tr>
<th>Indicator</th>
<th><strong>Demographic Process:</strong> MORTALITY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Indicator</strong></td>
<td><strong>Crude Death Rate</strong></td>
</tr>
<tr>
<td>Definition/Formula/Interpretation</td>
<td>Number of deaths per thousand population. Rough indicator of mortality.</td>
</tr>
</tbody>
</table>
| Data Elements | ▶ Number of deaths for a particular year  
▶ Mid-year population |
| Agency/Data Source | NSO/NDS |
| Lowest Area Domain | Province/City |
| **Indicator** | **Life expectancy at birth** |
| Definition/Formula/Interpretation | Average number of years a newborn could expect to live, if the newborn were to pass through life subject to the age-specific death rates of a given period. |
| Data Elements | ▶ Age at death |
| Agency/Data Source | Population Census (POPCEN)/Census of Population and Housing (CPH) |
| Frequency of Statistics | Every five/ten years |
| Lowest Area Domain | Municipality |
| **Indicator** | **Infant mortality rate** |
| Definition/Formula/Interpretation | Number of deaths among infants (children aged less than one year) per thousand live births. Closely associated with many development indicators. |
| Data Elements | ▶ Number of deaths in a given year among infants  
▶ Number of live births in same year |
| Frequency of Statistics | Annual |
| Lowest Area Domain | Province/City |
| **Indicator** | **Maternal mortality rate** |
| Definition/Formula/Interpretation | Number of deaths among women as a result of childbearing per 100 000 live births in a given year |
| Data Elements | ▶ Number of deaths among women as a result of childbearing  
▶ Total number of live births |
| Agency/Data Source | NSCB/TWG |
| Frequency of Statistics | Annual |
| Lowest Area Domain | Province/City |
### TABLE 3 (cont.)
Definition, data elements and availability of selected core indicators

#### Demographic Process: Migration

<table>
<thead>
<tr>
<th>Indicator</th>
<th>In-migration rate/Out-migration rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition/Formula/Interpretation</td>
<td>In-migration rate (between year t and year t+n) is computed as the number of in-migrants between year t and year t+n divided by population in year t, times 1 000. Out-migration rate (between year t and year t+n) is the number of out-migrants between year t and year t+n divided by population in year t, times 1 000.</td>
</tr>
</tbody>
</table>
| Data Elements | ▶ Number of in-migrants in year t  
▶ Number of in-migrants in year t+n  
▶ Number of out-migrants in year t  
▶ Number of out-migrants in year t+n  
▶ Population in year t  
▶ Population in year t+n |
| Agency/Data Source | NSCB/POPCEN/CPH |
| Frequency of Statistics | Every ten years |
| Lowest Area Domain | Municipality |

#### Demographic Outcome: Population Size

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Population growth rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition/Formula/Interpretation</td>
<td>Average annual rate of change of population size between year t and year t+n. Measures how fast the population is growing.</td>
</tr>
</tbody>
</table>
| Data Elements | ▶ Population in year t  
▶ Population in year t+n |
| Agency/Data Source | NSCB/POPCEN/CPH |
| Frequency of Statistics | Every five/ten years |
| Lowest Area Domain | Barangay |

#### Demographic Outcome: Population Structure

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Sex ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition/Formula/Interpretation</td>
<td>Number of males per hundred females in a particular population.</td>
</tr>
</tbody>
</table>
| Data Elements | ▶ Male population  
▶ Female population |
| Agency/Data Source | NSCB/POPCEN/CPH |
| Frequency of Statistics | Every five/ten years |
| Lowest Area Domain | Barangay |
### TABLE 3 (cont.)
Definition, data elements and availability of selected core indicators

<table>
<thead>
<tr>
<th><strong>Indicator</strong></th>
<th><strong>Definition/Formula/Interpretation</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Demographic Outcome : POPULATION STRUCTURE</strong></td>
<td>Percentage of population aged under 15 years, 15–64 years and 65 years and over</td>
</tr>
<tr>
<td><strong>Definition/Formula/Interpretation</strong></td>
<td>Population aged under 15 years (young dependent persons) divided by total population, times 100; Population aged 15–64 years (productive or working age population) divided by total population, times 100; Population aged 65 years and over (old-age persons) divided by total population, times 100.</td>
</tr>
<tr>
<td><strong>Data Elements</strong></td>
<td>- Population aged under 15 years</td>
</tr>
<tr>
<td></td>
<td>- Population aged 15–64 years</td>
</tr>
<tr>
<td></td>
<td>- Population aged 65 years and over</td>
</tr>
<tr>
<td></td>
<td>- Total population</td>
</tr>
<tr>
<td><strong>Agency/Data Source</strong></td>
<td>NSO/POPCEN/CPH</td>
</tr>
<tr>
<td><strong>Frequency of Statistics</strong></td>
<td>Every five/ten years</td>
</tr>
<tr>
<td><strong>Lowest Area Domain</strong></td>
<td>Barangay</td>
</tr>
</tbody>
</table>

### Demographic Outcome : HOUSEHOLD CHARACTERISTICS

<table>
<thead>
<tr>
<th><strong>Indicator</strong></th>
<th><strong>Definition/Formula/Interpretation</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Definition/Formula/Interpretation</strong></td>
<td>Average household size</td>
</tr>
<tr>
<td></td>
<td>Average number of persons in a household. The ratio estimate (or total household population divided by total number of households) is based on the assumption that the total number of household population is evenly distributed among all existing households in the specific geographic area of interest.</td>
</tr>
<tr>
<td><strong>Data Elements</strong></td>
<td>- Household population</td>
</tr>
<tr>
<td></td>
<td>- Number of households</td>
</tr>
<tr>
<td><strong>Agency/Data Source</strong></td>
<td>NSO/POPCEN/CPH</td>
</tr>
<tr>
<td><strong>Frequency of Statistics</strong></td>
<td>Every five/ten years</td>
</tr>
<tr>
<td><strong>Lowest Area Domain</strong></td>
<td>Barangay</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Indicator</strong></th>
<th><strong>Definition/Formula/Interpretation</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Definition/Formula/Interpretation</strong></td>
<td>Percentage of households by sex of household head</td>
</tr>
<tr>
<td></td>
<td>Male/Female disaggregation of household head statistics.</td>
</tr>
<tr>
<td><strong>Data Elements</strong></td>
<td>- Number of male household heads</td>
</tr>
<tr>
<td></td>
<td>- Number of female household heads</td>
</tr>
<tr>
<td><strong>Agency/Data Source</strong></td>
<td>NSO/POPCEN/CPH</td>
</tr>
<tr>
<td><strong>Frequency of Statistics</strong></td>
<td>Every five/ten years</td>
</tr>
<tr>
<td><strong>Lowest Area Domain</strong></td>
<td>Barangay</td>
</tr>
</tbody>
</table>
TABLE 3 (cont.)
Definition, data elements and availability of selected core indicators

### Demographic Outcome: HOUSEHOLD CHARACTERISTICS

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Population density</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Definition/Formula/Interpretation</strong></td>
<td>Number of persons per unit of land area. Expressed as population per square kilometre of land. Simplistic representation of the relation between population and available resources in a particular locality.</td>
</tr>
<tr>
<td><strong>Data Elements</strong></td>
<td>Population ▶ Land area</td>
</tr>
<tr>
<td><strong>Agency/Data Source</strong></td>
<td>NSO/POPCEN/CPH</td>
</tr>
<tr>
<td><strong>Frequency of Statistics</strong></td>
<td>Every five/ten years</td>
</tr>
<tr>
<td><strong>Lowest Area Domain</strong></td>
<td>Barangay</td>
</tr>
</tbody>
</table>

### Socio-economic Process: LABOUR AND EMPLOYMENT

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Labour force participation rate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Definition/Formula/Interpretation</strong></td>
<td>Percent of population aged 15 years and over who are employed, or unemployed but looking for work</td>
</tr>
<tr>
<td><strong>Data Elements</strong></td>
<td>Number of persons aged 15 years and over who are employed, or unemployed but looking for work ▶ Population aged 15 years and over</td>
</tr>
<tr>
<td><strong>Agency/Data Source</strong></td>
<td>NSO/Labour Force Survey (LFS)</td>
</tr>
<tr>
<td><strong>Frequency of Statistics</strong></td>
<td>Quarterly</td>
</tr>
<tr>
<td><strong>Lowest Area Domain</strong></td>
<td>Province/City</td>
</tr>
</tbody>
</table>

### Socio-economic Outcome: LABOUR AND EMPLOYMENT

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Unemployment rate</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Definition/Formula/Interpretation</strong></td>
<td>Number of unemployed persons per 100 persons in the labour force (defined as persons aged 15 years and over both employed and unemployed but looking for work).</td>
</tr>
<tr>
<td><strong>Data Elements</strong></td>
<td>Number of unemployed persons aged 15 years and over ▶ Number of employed persons aged 15 years and over</td>
</tr>
<tr>
<td><strong>Agency/Data Source</strong></td>
<td>NSO/LFS</td>
</tr>
<tr>
<td><strong>Frequency of Statistics</strong></td>
<td>Quarterly</td>
</tr>
<tr>
<td><strong>Lowest Area Domain</strong></td>
<td>Province/City</td>
</tr>
</tbody>
</table>
### Guidelines on the collection of demographic and socio-economic information on fishing communities

**TABLE 3 (cont.)**

Definition, data elements and availability of selected core indicators

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Percentage of women/men by schooling completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition/Formula/Interpretation</td>
<td>Categories of highest schooling completed are: No grade completed, Grades I–IV, Grades V–VII, Undergraduate–Secondary, Graduate–Secondary, Post-Secondary, Undergraduate–College, Graduate–College, Post-Graduate.</td>
</tr>
</tbody>
</table>
| Data Elements | ► Number of women by category of highest schooling completed  
► Number of men by category of highest schooling completed |
| Agency/Data Source | NSO |
| Frequency of Statistics | Every school year |
| Lowest Area Domain | Municipality |

**Socio-economic Outcome : EDUCATION AND LITERACY**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Functional literacy rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition/Formula/Interpretation</td>
<td>Percentage of the population aged 10 years and over having a level of literacy that includes not only reading and writing skills but also numerical skills, and the ability to participate fully and effectively in community activities.</td>
</tr>
</tbody>
</table>
| Data Elements | ► Population aged 10 years and over who are functionally literate  
► Population aged 10 years and over |
| Agency/Data Source | NSO/Functional Literacy, Education and Mass Media Survey (FLEMS) |
| Frequency of Statistics | Every six years |
| Lowest Area Domain | Province/City |

**Socio-economic Process : HEALTH AND SANITATION**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Percentage of households availing of health care services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition/Formula/Interpretation</td>
<td>Number of households availing of government health care services divided by total number of households, times 100.</td>
</tr>
</tbody>
</table>
| Data Elements | ► Number of households availing of government health care services  
► Number of households |
| Agency/Data Source | Department of Health (DOH)/Health Intelligence Service (HIS) |
| Frequency of Statistics | Annual |
| Lowest Area Domain | Region |
### TABLE 3 (cont.)
Definition, data elements and availability of selected core indicators

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Percentage of household with sanitary type of toilet facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Definition/Formula/Interpretation</strong></td>
<td>Types of sanitary toilet facilities: water sealed, sewer/septic tank and closed pit; Types of unsanitary toilet facilities: open pit, others (pail system, etc.) and none.</td>
</tr>
<tr>
<td><strong>Data Elements</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>► Number of households with sanitary toilet facilities</td>
</tr>
<tr>
<td></td>
<td>► Number of households</td>
</tr>
<tr>
<td><strong>Agency/Data Source</strong></td>
<td>NSO/Family Income and Expenditure Survey (FIES)</td>
</tr>
<tr>
<td><strong>Frequency of Statistics</strong></td>
<td>Every three years</td>
</tr>
<tr>
<td><strong>Lowest Area Domain</strong></td>
<td>Province/City</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Percentage of households with safe main source of drinking water</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Definition/Formula/Interpretation</strong></td>
<td>Types of safe main source of drinking water include own use or shared/faucet/community water system, own use or shared/tubed/piped/deep well. Types of doubtful source include tubed/piped/shallow well.</td>
</tr>
<tr>
<td><strong>Data Elements</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>► Number of households with safe main source of drinking water</td>
</tr>
<tr>
<td></td>
<td>► Number of households</td>
</tr>
<tr>
<td><strong>Agency/Data Source</strong></td>
<td>NSO/FIES</td>
</tr>
<tr>
<td><strong>Frequency of Statistics</strong></td>
<td>Every three years</td>
</tr>
<tr>
<td><strong>Lowest Area Domain</strong></td>
<td>Province/City</td>
</tr>
</tbody>
</table>

### Socio-economic Process: Health and Sanitation

### Socio-economic Process: Housing and Household Convenience

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Percentage of households with owned/rented or shared house and/or lot</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Definition/Formula/Interpretation</strong></td>
<td>This refers to secure tenure status of households and not to illegal occupancy of house and/or lot.</td>
</tr>
<tr>
<td><strong>Data Elements</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>► Number of households with owned/rented or shared house and/or lot</td>
</tr>
<tr>
<td></td>
<td>► Number of households</td>
</tr>
<tr>
<td><strong>Agency/Data Source</strong></td>
<td>NSO/FIES</td>
</tr>
<tr>
<td><strong>Frequency of Statistics</strong></td>
<td>Every three years</td>
</tr>
<tr>
<td><strong>Lowest Area Domain</strong></td>
<td>Province/City</td>
</tr>
</tbody>
</table>
### TABLE 3 (cont.)
**Definition, data elements and availability of selected core indicators**

**Socio-economic Process: Housing and Household Convenience**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Percentage of households with house made of durable materials</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Definition/Formula/Interpretation</strong></td>
<td>Durable materials for the roof and outer walls are galvanized iron, aluminium, tile, concrete, brick, stone, wood, plywood and asbestos.</td>
</tr>
<tr>
<td><strong>Data Elements</strong></td>
<td>▶ Number of households with house made of durable materials&lt;br&gt;▶ Number of households</td>
</tr>
<tr>
<td><strong>Agency/Data Source</strong></td>
<td>NSO/TIES</td>
</tr>
<tr>
<td><strong>Frequency of Statistics</strong></td>
<td>Every three years</td>
</tr>
<tr>
<td><strong>Lowest Area Domain</strong></td>
<td>Province/City</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Percentage of households with electricity connection</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Definition/Formula/Interpretation</strong></td>
<td>Households with electricity connection are those with power lines for their houses.</td>
</tr>
<tr>
<td><strong>Data Elements</strong></td>
<td>▶ Number of households with electricity connection&lt;br&gt;▶ Number of households</td>
</tr>
<tr>
<td><strong>Agency/Data Source</strong></td>
<td>NSO/TIES</td>
</tr>
<tr>
<td><strong>Frequency of Statistics</strong></td>
<td>Every three years</td>
</tr>
<tr>
<td><strong>Lowest Area Domain</strong></td>
<td>Province/City</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Percentage of households with household convenience</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Definition/Formula/Interpretation</strong></td>
<td>Number of households with radio/radio cassette/television/computer/other household convenience divided by total number of households, times 100.</td>
</tr>
<tr>
<td><strong>Data Elements</strong></td>
<td>▶ Number of households with radio/radio cassette/television/computer/other household convenience&lt;br&gt;▶ Number of households</td>
</tr>
<tr>
<td><strong>Agency/Data Source</strong></td>
<td>NSO/TIES</td>
</tr>
<tr>
<td><strong>Frequency of Statistics</strong></td>
<td>Every three years</td>
</tr>
<tr>
<td><strong>Lowest Area Domain</strong></td>
<td>Province/City</td>
</tr>
</tbody>
</table>
## TABLE 3 (cont.)
**Definition, data elements and availability of selected core indicators**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Percentage of households with access to family planning services</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Definition/Formula/Interpretation</strong></td>
<td>Number of households with access to family planning services of the government divided by total number of households, times 100.</td>
</tr>
<tr>
<td><strong>Data Elements</strong></td>
<td></td>
</tr>
<tr>
<td>▶ Number of households with access to family planning services</td>
<td></td>
</tr>
<tr>
<td>▶ Number of households</td>
<td></td>
</tr>
<tr>
<td><strong>Agency/Data Source</strong></td>
<td>NSO/Family Planning Survey</td>
</tr>
<tr>
<td><strong>Frequency of Statistics</strong></td>
<td>Annual</td>
</tr>
<tr>
<td><strong>Lowest Area Domain</strong></td>
<td>Region</td>
</tr>
<tr>
<td><strong>Indicator</strong></td>
<td>Contraceptive prevalence rate</td>
</tr>
<tr>
<td><strong>Definition/Formula/Interpretation</strong></td>
<td>Percentage of currently married women within the reproductive ages of 15–49 years that are currently using a family planning method.</td>
</tr>
<tr>
<td><strong>Data Elements</strong></td>
<td></td>
</tr>
<tr>
<td>▶ Number of married women aged 15–49 years currently using a family planning method</td>
<td></td>
</tr>
<tr>
<td>▶ Number of married women aged 15–49 years</td>
<td></td>
</tr>
<tr>
<td><strong>Agency/Data Source</strong></td>
<td>NSO/Family Planning Survey</td>
</tr>
<tr>
<td><strong>Frequency of Statistics</strong></td>
<td>Annual</td>
</tr>
<tr>
<td><strong>Lowest Area Domain</strong></td>
<td>Region</td>
</tr>
</tbody>
</table>

### Socio-economic Outcome: INCOME

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Average family income (overall, by income decile, by sex of household head)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Definition/Formula/Interpretation</strong></td>
<td>Average family income overall and within each of the ten income (decile) groups, disaggregated by sex of household head.</td>
</tr>
<tr>
<td><strong>Data Elements</strong></td>
<td></td>
</tr>
<tr>
<td>▶ Average family income</td>
<td></td>
</tr>
<tr>
<td>▶ Income decile groups</td>
<td></td>
</tr>
<tr>
<td>▶ Sex of household head</td>
<td></td>
</tr>
<tr>
<td><strong>Agency/Data Source</strong></td>
<td>NSO/FIES</td>
</tr>
<tr>
<td><strong>Frequency of Statistics</strong></td>
<td>Every three years</td>
</tr>
<tr>
<td><strong>Lowest Area Domain</strong></td>
<td>Province/City</td>
</tr>
</tbody>
</table>
varies according to the size of the population and the type of sample, it should not normally be less than about 10 percent of the population\(^14\).  

### 4.4 Household and individual questionnaires

The household survey can make use of two-tiered structured questionnaires – a general questionnaire administered to the household head followed by a more detailed questionnaire for each eligible male and female member in the household. The household questionnaire collects information on the demographic characteristics of the household members and on different aspects of the material living conditions and physical environment of the household. The individual level questionnaire seeks to elicit more qualitative information on work/occupation, migration, occupational and intergenerational mobility, attitudes and behaviour regarding fertility and family planning and on gender roles.  

The household and individual level questionnaires, presented as Annex 3 and 4 respectively, have been formulated using inputs from different questionnaires currently in use by government. These questionnaires include: (1) the FAO micro-level study household and individual questionnaires; (2) the NSO Annual Poverty Indicators Survey questionnaire; (3) the NSO Census of Population and Housing (Socio-Economic and Demographic Characteristics) questionnaire; and (4) the NSO/DOH National Demographic and Health Survey questionnaire. Inputs from the FAO questionnaire were selected on the basis of the significant findings of the micro-level study, particularly in terms of their impact on the population dynamics of fishing communities. Inputs from the various NSO questionnaires provide consistency (and thus comparability of measurements) with local definitions and conventions.

#### 4.4.1 Household schedule

Local definitions employed by the NSO will be used to allow for comparisons with other official documents\(^15\).  

**A. Demographic characteristics**

**Household**

A household is a social unit consisting of a person living alone or a group of persons who: (1) sleep in the same housing unit and (2) have a common arrangement for the preparation and consumption of food. In most cases, a household consists of persons who are related by kinship ties, like parents and their children. In some instances, several generations of familial ties are represented in one household; in other instances, even more distant relatives are members of the household.

Household helpers, boarders and non-relatives are considered members of the household provided they sleep in the same housing unit, have common arrangements for the preparation and consumption of food and do not usually go home

\(^{14}\) Conyers, 1993.  

\(^{15}\) Definitions for the household schedule were taken from the 1990 Census of population and housing report no. 3: Socio-economic and demographic characteristics (NSO, 1992) and the 1998 Annual poverty indicators survey, final report (NSO, 2000).
to their families at least once a week. A person who shares a housing unit with a household but who cooks his/her meals separately or consumes his/her food elsewhere is not considered a member of the household he/she shares the housing unit with. That person is listed as a separate household.

**Head of household**

The person responsible for the care and organization of the household is generally considered as the head of the household. He/she usually provides the chief source of income for the household.

In the case of a household consisting of two or more unrelated persons sharing the same cooking facilities and meals, the head is usually the eldest male/female in the group regarded as such by the other members of the household.

**Age and date of birth**

Data on the age of the population are obtained by asking the month and year of birth, and the age in years of an individual at the time of the household visit.

**Marital status**

Marital or civil status is recorded for all persons aged 10 years and over. The classifications for marital status are: single, married, widowed, separated/divorced, others and marital status unknown (i.e. a person whose marital status is not known to the respondent or whose marital status is being concealed by the respondent).

**Religious affiliation**

Religious affiliation refers to a particular system of beliefs, attitudes, emotions and behaviours constituting a person’s relationship with the powers and principalities of the universe.

**Mother tongue**

Mother tongue refers to the language/dialect a person spoke during early childhood or the language/dialect that person first learned to speak. Data on mother tongue is primarily used to determine the ethnic origin of a person long after assimilation to the other customs of the majority population has taken place.

**Language**

Language refers to the language or dialect spoken most of the time by members of the household.

**B. Education and literacy**

**Highest educational attainment**

Highest educational attainment refers to the highest grade or year completed in school, college or university by persons aged 5 years and over. Post-secondary courses refer to formal education covering non-degree programmes lasting up to three years following after secondary level education. These courses are primarily concerned with developing strong and appropriately trained middle-level human resources. Undergraduate post-secondary students refer to those who have taken a post-secondary course but have not completed the course.

**Literacy**

Literacy is the ability to read and write a simple message. A person is literate when he/she can both read and write a simple message in any language or dialect. A person who cannot both read and write a simple message is illiterate. Also, a person is considered as illiterate if he/she can only read and write numbers or his own name, or if a person can read but not write.

**C. Employment/economic activity**

**Occupation**

Occupation refers to the specific job or work/business that a person was engaged in for most of the time during the last twelve months preceding the interview. Usual activity/occupation (e.g. palay farmer, carpenter, fisherman, etc.) would be the person’s principal means of earning a living during the last twelve months preceding the interview.

A person is considered a gainful worker or usually working most of the time if he/she worked for at least ten hours a week for six months or longer during the last twelve months preceding the interview. He/she may be working for pay; for profit in his/her own farm, business, private practice of a profession or trade; or without pay on his/her own family farm or business.

**D. Health status**

Health status tracks the type of illnesses or injuries members of the household incurred during the month preceding the interview. A person is considered to have visited any health facility if he/she consulted or received any medical care from any health facility. Health facilities include government hospitals, private hospitals, private clinics, rural health unit/health centres, and barangay health stations.

**E. Income**

Total income refers to the sum of the incomes from all sources of all household members earned during the last twelve months preceding the interview.

---

16 Rice.
F. Housing and household facilities

Housing facilities occupied by a household are among the best indicators of a household’s economic status. In combination with household conveniences, they are often used as proxy measures of household wealth.

Building

A building is defined as any structure built, designed or intended for the enclosure, shelter or protection of any person, animal or property. A building is comprised of one or more rooms and/or other spaces covered by a roof and usually enclosed within external walls, or with common dividing walls with adjacent buildings, which usually extend from the foundation to the roof.

Housing unit

A housing unit is a structurally separate and independent place of abode constructed, converted or arranged for habitation by one or more households. Housing units can be classified in terms of their quality as follows: (1) dwelling units constructed of solid or strong materials; (2) semi-solid or light materials; (3) intermediate type construction; and (4) makeshift construction.

Tenure status

Tenure status of the housing unit measures the family’s security in terms of arrangements made for housing occupancy.

Fuel for lighting

The proportion of households with access to electricity can provide planners with a useful indication of which areas are in need of community lighting services.

Household conveniences

The affluence of a household can be measured in terms of the facilities that are found within its dwelling. The presence/absence of household conveniences gives an indication of whether the lifestyle of the household has modernized due to the presence of electricity and provides leisure statistics. The identification of means of communication through which the population can be easily reached (e.g. radio, television) can be important for public information and education purposes.

G. Water and sanitation

Main source of drinking water

Data on main source of drinking water provides information on the proportion of households with access to potable water supply. Water sources are distinguished as: (1) community water systems, (2) tubed or piped wells, (3) dug wells, (4) springs/lakes/river/rain and (5) peddlers. Water sources differ not only in the manner in which water is accessed, but also in the safety of the water that they dispense. Piped sources tend to deliver safer water than unpiped ones, deep wells deliver safer water than shallow dug wells and well water is safer than water coming from lakes and rivers.

Toilet facility

The proportion of households with access to sanitary toilet facilities is an indicator of the health and sanitation status of households. Sanitary toilet facilities are toilet facilities that are water-sealed and connected to public or private sewerage systems, septic tanks or some other type of depository. Considered unsanitary facilities are closed or open dug pits, the use of pails or no toilet facilities at all.

4.4.2 Individual questionnaire

A. Respondent’s background

Demographic characteristics (such as age, religion, highest educational attainment, etc.) of the respondent are elicited.

B. Alternative livelihoods

In the context of coastal resource management, the rationale for promoting alternative livelihoods in fishing communities is to reduce pressure on the fishery resource while it is being allowed to regenerate. This means reducing fisherfolk dependence on fishery resources as a major source of livelihood. The findings of the FAO micro-level study suggested that the number of fisherfolk in an area can be expected to increase or decline depending on whether or not the fisheries are profitable and on whether or not fisherfolk have access to alternative livelihoods for their sustenance. It is thus important to know what other livelihood activities are available in the area to fisherfolk.

C/D. Migration and intergenerational and occupational mobility

Internal migration as a determinant of demographic processes is not very well documented in the Philippines. Such data are hard to come by because internal migratory movements are not controlled and monitored. People can move freely and settle in any part of the Philippines that they wish to live in. The only source of comprehensive internal migration data is the population census that
takes place every ten years and includes questions on the individual’s residence five years prior to the census. These same questions are asked in this questionnaire to elicit migration information. Migration can alter demographic outcomes such as the age–sex structure and other compositional characteristics of the population. It can also affect levels of resource use. In- and out-migration rates give an indication of the stability and profitability of the fishery. In the absence of migration data, comparing the main occupations of sons with the main occupations of their fathers can provide an indication of intergenerational and occupational mobility.

E. Fertility and family planning

The questions on fertility and family planning are meant to elicit information on women’s fertility behaviour, knowledge and practice of family planning. Access to family planning services means that married women of reproductive age (15–49 years) have knowledge of where to avail of family planning services. Practice of family planning refers to the use of any method of contraception. The practice of family planning for the number and spacing of children is usually associated with a better quality of health and higher rates of survival for both mother and child.

F. Gender considerations

Gender is a point of concern for coastal resource management. Women play an important role in resource management and contribute greatly to the food security of their households. They also participate actively in the economic and political activities in fishing communities. However, given the scarcity of relevant gender-differentiated data, these contributions are not sufficiently taken into account. As women constitute one of the primary stakeholders in any coastal resource management initiative, there must be a deeper understanding of their roles and contributions. In addition to producing sex-segregated data, coastal resource management programmes must examine women’s roles and contributions and consider their active involvement. The gender activity profile provides a tool for assessing gender roles and activities.

4.5 Data processing and maintenance

To formulate the database on core indicators, data collected by the household survey can be processed using an appropriate and user-friendly computer software. A preliminary step in setting up the database would be the field-testing and validation of the selected indicators and the survey questionnaires. A workshop involving the various stakeholders should be organized for this purpose. The workshop should result in the final determination of the indicators to be regularly collected and monitored, and the frequency of their collection. It should also identify the agencies responsible for maintaining the database. The indicators need to be validated in terms of their availability, accessibility, use and feasibility of collection.

At the national level, the BFAR can take the lead in maintaining the database as it is already involved in preparing Municipal Coastal Environmental Profiles (MCEPs) through the ADB-funded Survey of Coastal Municipalities in the Philippines project. The core indicators would, in effect, be an enhancement of the socio-economic and demographic component of the MCEP. The persons responsible for the project have indicated a desire and willingness to include and incorporate a socio-economic and demographic dimension in their data collection, provided some funding support is provided. The BFAR is also implementing the National Stock Assessment Program, which generates catch and effort statistics and maintains a nationwide network of fisheries data collectors who can be trained in the collection of socio-economic and demographic information.

At the local level, the planning units of LGUs can include the collection of core indicators as part of their existing and regular planning functions. LGUs are in fact mandated by the Local Government Code to prepare and maintain socio-economic profiles. In line with their mandate to provide coastal resource management as a basic service to the community, LGUs can be requested to disaggregate the data they collect specifically for the coastal communities.

The FARMCs may not have the capability and resources to maintain a database. However, as its membership is comprised of representatives from the LGUs and the local development councils, there may not be a need for a separate database.

---

17 The last Census on Population and Housing in the Philippines was conducted in 2000. Data at provincial level are to be released in 2002.
The FARMCs can just link up and coordinate with the planning units of the LGUs. FARMCs, as partners of government in resource management and local governance in fishing communities, must be given priority access to the database. The UPV may choose to maintain a database for teaching purposes, for its outreach programmes and extension services, as well as to provide the bases for further research on population dynamics of fishing communities.
REFERENCES


Bureau of Fisheries and Aquatic Resources. 1996. Main report of the second national fisheries workshop on policy planning and industry development. Quezon City, Philippines.

Bureau of Fisheries and Aquatic Resources. 1999. Philippine fisheries profile. Quezon City, Philippines.


Annex 1

List of 109 POPDEV indicators

POPULATION PROCESSES

Fertility

1. Crude Birth Rate
2. Age-Specific Fertility Rate
3. Total Fertility Rate

Mortality

4. Crude Death Rate
5. Life Expectancy at Birth (both sexes, male and female)
6. Infant Mortality Rate (both sexes, male and female)
7. Child (under 5 years old) Mortality Rate (both sexes, male and female)
8. Maternal Mortality Rate (overall, by age-group)
9. Percent of Deaths Due to 1st/2nd/3rd Leading Cause of Death

Migration

10. In-Migration Rate; Out-Migration Rate

POPULATION OUTCOMES

Population Size

11. Population Growth Rate

Population Structure

12. Sex Ratio
13. Median Age of the Population
14. Dependency Ratio (Old Age, Child, Total)
15. Percentage of Population Aged Under 15, 15–64 and 65 years and over (both sexes, male and female)
16. Percentage of Female Population aged 15–49 years

Spatial Distribution

17. Percent Urban
18. Population Density
19. Percentage of Population by Geographic Classification
Household Characteristics

20 Growth Rate
21 Average Household Size
22 Percentage of Households by Sex of Head
23 Percentage of Households by Composition of Household Members

DEVELOPMENT PROCESSES

Macroeconomics and Financing

24 Local Government Income by Source
25 Local Government Expenditure by Function (for basic social services, for gender development)
26 Consumer Price Index (all items)
27 Average Annual Inflation Rate
28 Percentage of Family Expenditure on Food and Non-food (by item group)

Labour and Employment

29 Labour Force Participation Rate (both sexes, by age group)
30 Level and Percent of Employment (by sector: agriculture, fishery, forestry, industry, services; both sexes)
31 Level and Percent of Employment by Class of Worker, Wage and Salary (own account, unpaid family worker; both sexes)
32 Percentage of Working Children by Age (both sexes)
33 Index of Occupation Segregation
34 Average Time Spent During Unpaid Household Services (both sexes)

Agriculture and Fishery

35 Percent of Agricultural Land to Total Land Area
36 Agricultural Land Area Per Farm Worker, Per Farm, Per Capita
37 Percent Ratio of Irrigated Land to Total Potential Irrigable Land
38 Percentage of Local Production to National Production by Type (cereals, major crops, other crops, livestock, fishery)

Agrarian Reform

39 Percentage of Land Parcels by Tenure Status

Industry and Trade

40 Labour Productivity by Industry Sector

Environment and Natural Resources

41 Percentage of Forests and Woodlands to Total Land Area
42 Percentage of Denuded Forest Area to Total Land Area
43 Water Pollution Index
44 Air Pollution Index
### Education

45 Elementary School Participation Rate (all grades, by grade level); Secondary School Participation Rate (all years, by year level)
46 Elementary Cohort Survival Rate (both sexes); Secondary Cohort Survival Rate (both sexes)
47 Elementary Retention Rate (by grade level)
48 Elementary Drop-Out Rate (by grade level)
49 Percentage of National Elementary Achievement Test (NEAT) Passers; Percentage of National Secondary Achievement Test (NSAT) Passers
50 Elementary School Pupil–Teacher Ratio; Secondary School Pupil–Teacher Ratio
51 Elementary School Pupil–Textbook Ratio; Secondary Pupil–Textbook Ratio
52 Percentage of Women/Men by Schooling Completed
53 Median Years of Schooling for Specific Age Groups
54 Per Capita Cost of Basic Education

### Nutrition

55 Percentage of Households with Adequate Energy Intake
56 Annual per Capita Food Threshold
57 Percentage of Pregnant and Lactating Mothers Provided with Iron and Iodine Supplements During Pregnancy for Breastfeeding Period

### Health

58 Population per Midwife
59 Population per Nurse
60 Population per Doctor
61 Population–Hospital Bed Ratio
62 Percentage of Immunized 12–23 Month-old Children (fully immunized by type of immunization)
63 Percentage of Households Who Availed of Health Care Services
64 Percentage of Births Attended by Health Personnel
65 Percentage of Deaths Attended by Health Personnel
66 Percentage of Population Covered by GSIS/SSS

### Family Planning

67 Contraceptive Prevalence Rate (for any methods, by method used)
68 Percentage of Households with Access to Family Planning Services

### Housing

69 Percentage of Households with Owned/Rented or Shared House and/or Lot
70 Percentage of Households Accepting Danger Areas
71 Percentage of Households with House Made of Durable Materials
72 Average Floor Area of Housing Units

### Water and Sanitation

73 Percentage of Households with Sanitary Type of Toilet Facilities
74 Percentage of Households with Safe Main Source of Drinking Water
75 Percentage of Households with Sanitary Type of Garbage Disposal
Energy

76 Percentage of Households with Electricity Connection
77 Energy Consumption per Capita

Transportation

78 Percentage of Paved Roads (national, local)

Communication

79 Postal Density (post offices/mailing stations per 1,000 population)
80 Telephone Density (per 1,000 population)
81 Percentage of Households with Radio/Radio Cassette/Television/Computer

Public Safety

82 Crime Rate by Type (crimes vs. persons; crimes vs. property)
83 Population–Policeman Ratio
84 Population–Fireman Ratio
85 Percentage of Crime Victims by Sex
86 Percentage of Abusers of Minors by Sex
87 Percentage of Perpetuators of Family Violence by Sex

Social Welfare

88 Percentage of Poor Households Provided with Basic Social Services
89 Percentage of Clientele (household head needy adults, children in difficult situations) served by DSWD by Sex

Tourism

90 Number of Visitors

Science and Technology

91 Population S&T Professional Ratio

Community Development/Development Administration

92 Percentage of Elective Position by Sex of Persons Occupying the Positions
93 Percentage of Government Positions According to Level (1st, 2nd, 3rd) by Sex of Persons Holding the Positions

DEVELOPMENT OUTCOMES

Employment Status

94 Unemployment Rate (both sexes)
95 Underemployment Rate (both sexes)
Income Status

96  Average Family Income (overall, by income decile, by sex of household head)
97  Per Capita Income of Family (overall, by sex of household head)
98  Poverty Incidence (overall, by sex of household head)
99  Subsistence Incidence (overall, by sex of household head)

Educational Status

100 Simple Literacy Rate (both sexes)
101 Functional Literacy Rate (both sexes)

Nutritional Status

102 Percentage of Pre-School Children who are Moderately and Severely Underweight (both sexes)
103 Percentage of School Children who are Moderately and Severely Underweight (both sexes)
104 Percentage of Pregnant Lactating Woman who are Moderately and Severely Underweight
105 Prevalence of Anaemia Iron Deficiency (by age group, both sexes)
106 Prevalence of Bitot’s Spot Vitamin A Deficiency (by age group, both sexes)
107 Prevalence of Goitre Iodine Deficiency (by age group, both sexes)

Health Status

108 Percentage of 0–6 Month Old Children with Low Birth Weight (less than 2.5 kilograms)
109 Morbidity Rate of 1st/2nd/3rd Leading Cause of Morbidity
Annex 2

Guidelines for focus group discussions

Selection of groups for group discussions and individuals for semi-structured interviews

In each village, four groups were formed according to age and sex criteria:

- men of about 55 years
- women of about 55 years
- men of about 25 years
- women of about 25 years

In each group, focus group discussions were carried out following a semi-structured interview schedule, described below.

Topics covered by focus group discussions and individual interviews in fishing villages

- Changes in the geographic distribution and demographic situation of fisherfolk and their socio-economic status over the past 20 years

A selected number of fisherfolk were asked to assess, according to their knowledge and awareness, how their personal lives and the lives of other fisherfolk in their area had changed over the past 20 years with regard to: the number of fishers in the area, the growth of their population, the extent of immigration and emigration in the communities, socio-economic status, etc. The assessment had to include an account of negative as well as positive changes.

Regarding socio-economic status, the following issues were assessed: ownership of main production factors; level and distribution of income; access to alternative income-earning activities; quality of housing; physical and social infrastructure and services; health care and nutrition; family size and structure; preferred and actual age at marriage; contraceptive use; political participation and decision-making at district/regional/village/household level; division of labour by gender. Other issues were also addressed.

- Changes in the number, type and quality of gear, fish catches and fish marketing over the past 20 years

The objective was to assess, as remembered by the fishers, the following: What were the changes in the types of fishing craft and gear used in the past 20 years and how did the numbers of fishing craft and gear change during that period? Moreover, what were the reasons for the above changes according to fisherfolk? What were the changes in the species caught and what were the changes in the quantities caught? What were the changes in production costs and incomes of fishers and in fish prices paid to fishers?

- Changes in perceptions regarding marriage, numbers of children and general social values and perspectives/outlook over the past 20 years

Focus group members discussed fertility-related issues such as: changes in actual and perceived ideal age at marriage for men and women; actual and ideal number of children to have; attitudes towards and practice of modern and traditional family planning; changes in personal ambitions and prospects.

- Changes in main occupations and occupational and socio-economic status over the past 20 years

Group members assessed general economic and social development. Needs at the level of the community and households, including constraints as perceived by discussion group members, were discussed. The perceived changes in socio-economic status and reasons for change in main occupations of household members were assessed.
Annex 3

Socio-economic and demographic profile questionnaire: head of household schedule

### A. DEMOGRAPHIC CHARACTERISTICS

<table>
<thead>
<tr>
<th>Family Members as of Date of Visit (Last Name, First Name)</th>
<th>Relationship to HH Head</th>
<th>Sex</th>
<th>Age</th>
<th>Date of Birth</th>
<th>Marital Status</th>
<th>Religious Affiliation</th>
<th>Mother Tongue</th>
<th>Language</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>02</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>03</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>04</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>05</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>06</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>07</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>08</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>09</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### B. EDUCATION AND LITERACY

<table>
<thead>
<tr>
<th>Has ____ ever attended school?</th>
<th>What is the highest educational attainment completed by ____?</th>
<th>What is the total numbers of years of schooling ____ successfully completed?</th>
<th>Can ____ read and write a simple message in any language or dialect?</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>02</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>03</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>04</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>06</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>07</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>08</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>09</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
C. EMPLOYMENT/ECONOMIC ACTIVITY

<table>
<thead>
<tr>
<th>Did ____ work at all or have a job or business during the past twelve months?</th>
<th>What was ____’s usual activity/occupation during the past twelve months?</th>
<th>In what kind of business or industry did ____ work during the past twelve months?</th>
<th>Did ____ look for a job at any time during the past twelve months?</th>
<th>Why did ____ not look for work?</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>02</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>03</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>04</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>05</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>06</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>07</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>08</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>09</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

D. HEALTH STATUS

<table>
<thead>
<tr>
<th>Did ____ get ill or injured during the past month?</th>
<th>What type of illnesses or injuries did ____ have during the past month?</th>
<th>Did ____ visit any health facility like a hospital or clinic etc. during the past month?</th>
<th>What health facility(ies) did ____ visit during the past month?</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>02</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>03</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>04</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>06</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>07</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>08</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>09</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### E. INCOME

#### E1. Income Source

*Please specify from which sources you and your household members earned an income and how much was earned from each source.*

<table>
<thead>
<tr>
<th>Source</th>
<th>Amount in Philippine Pesos Over Twelve-Month Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Catching fish (and selling catch after landing)</td>
<td>a.</td>
</tr>
<tr>
<td>b. Operation of fish ponds</td>
<td>b.</td>
</tr>
<tr>
<td>c. Renting out fish ponds to others</td>
<td>c.</td>
</tr>
<tr>
<td>d. Renting out fishing boats/engines/gear to others</td>
<td>d.</td>
</tr>
<tr>
<td>e. Processing of fish (e.g. smoking, drying)</td>
<td>e.</td>
</tr>
<tr>
<td>f. Marketing of fish</td>
<td>f.</td>
</tr>
<tr>
<td>g. Farming of crops and selling of harvest to others</td>
<td>g.</td>
</tr>
<tr>
<td>h. Buying crops from farmers and selling to others for profit</td>
<td>h.</td>
</tr>
<tr>
<td>i. Herding and raising cattle (livestock)</td>
<td>i.</td>
</tr>
<tr>
<td>j. Income from homestead (e.g. vegetable gardening)</td>
<td>j.</td>
</tr>
<tr>
<td>k. Buying and selling cattle</td>
<td>k.</td>
</tr>
<tr>
<td>l. Raising/selling poultry, geese, sheep, pigs and other small farm animals</td>
<td>l.</td>
</tr>
<tr>
<td>m. Income from business other than fishing</td>
<td>m.</td>
</tr>
<tr>
<td>n. Income from wage labour (all types)</td>
<td>n.</td>
</tr>
<tr>
<td>o. Income from salaried employment (service sector)</td>
<td>o.</td>
</tr>
<tr>
<td>p. Income from doing domestic work for others</td>
<td>p.</td>
</tr>
<tr>
<td>q. Income from remittances from relatives/friends/family members</td>
<td>q.</td>
</tr>
<tr>
<td>r. Income from lending money to others</td>
<td>r.</td>
</tr>
<tr>
<td>s. Income from savings (bank, insurance)</td>
<td>s.</td>
</tr>
<tr>
<td>t. Income from pension</td>
<td>t.</td>
</tr>
<tr>
<td>u. Other sources not listed above</td>
<td>u.</td>
</tr>
</tbody>
</table>

#### Estimated Total Income

#### E2. Perception of welfare level

a. How would you rate the financial situation of the household with regard to satisfying all the basic household needs (food, clothing, goods, services)?

1. More than sufficient
2. Sufficient
3. Barely sufficient
4. Insufficient

b. If you compare the financial situation of this household to the financial situation of other households in your neighbourhood, would you say that your household is:

1. Better off
2. About the same
3. Worse off
### F. HOUSING AND HOUSEHOLD FACILITIES

**At the time of visit . . .**

- **F1. Type of building/house**
  1. Single house
  2. Duplex
  3. Apartment/accessoria/condominium/townhouse
  4. Commercial/industrial/agricultural building/house
  5. Other housing unit, specify __________

- **F2. Construction material of the roof**
  1. Strong materials (galvanized iron, aluminium, tile, concrete, brick, stone, asbestos)
  2. Light materials (sawali, cogon, nipa, anahaw)
  3. Salvaged/makeshift materials
  4. Mixed but predominantly strong materials
  5. Mixed but predominantly light materials
  6. Mixed but predominantly salvaged materials

- **F3. Construction material of the outer walls**
  1. Strong materials (galvanized iron, aluminium, tile, brick, stone, wood, plywood, asbestos)
  2. Light materials (bamboo, sawali, cogon, nipa, anahaw)
  3. Salvaged/makeshift materials
  4. Mixed but predominantly strong materials
  5. Mixed but predominantly light materials
  6. Mixed but predominantly salvaged materials

- **F4. Tenure status of housing unit and lot**
  1. Owned
  2. Rented
  3. Shared
  4. Rent-free, with consent of owner
  5. Rent-free, without consent of owner
  6. Others, specify __________

- **F5. Fuel for lighting**
  1. Electricity
  2. Kerosene
  3. Liquefied petroleum gas
  4. Oil (vegetable, animal, etc.)
  5. Others, specify __________

- **F6. Household convenience**
  1. Radio/stereo
  2. Television set
  3. Refrigerator
  4. Sala set
  5. Dining set
  6. Car, jeep, motorcycle
  7. Washing machine
  8. Gas stove/gas range
  9. Telephone/cell phone
### G. WATER AND SANITATION

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>G1. Main source of water supply</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Own use faucet, community water system</td>
</tr>
<tr>
<td></td>
<td>2. Shared faucet, community water system</td>
</tr>
<tr>
<td></td>
<td>3. Own use tubed/piped deep well</td>
</tr>
<tr>
<td></td>
<td>4. Shared tubed/piped deep well</td>
</tr>
<tr>
<td></td>
<td>5. Dug well</td>
</tr>
<tr>
<td></td>
<td>6. Spring, river, stream, rain, etc.</td>
</tr>
<tr>
<td></td>
<td>7. Peddler</td>
</tr>
<tr>
<td></td>
<td>8. Others, specify ________________</td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>G2. Kind of toilet facility</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Own water-sealed, sewer/septic tank</td>
</tr>
<tr>
<td></td>
<td>2. Shared water-sealed, sewer/septic tank</td>
</tr>
<tr>
<td></td>
<td>3. Open pit</td>
</tr>
<tr>
<td></td>
<td>4. Others (pail system, etc.)</td>
</tr>
<tr>
<td></td>
<td>5. None</td>
</tr>
</tbody>
</table>
Annex 4

Socio-economic and demographic profile questionnaire: individual schedule

<table>
<thead>
<tr>
<th>A. RESPONDENT’S BACKGROUND</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B. WORK/OCCUPATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1. Do you have work/an occupation? _____Yes _____No</td>
</tr>
<tr>
<td>B2. If yes, please indicate whether work/occupation is main or additional/subsidiary:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Main</th>
<th>Additional/Subsidiary</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Fish catching with boats in open sea</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Fish catching along shores</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Fish farming</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Fish marketing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Fish processing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. Boat building/construction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>g. Farming/Agriculture on permanent plots</td>
<td></td>
<td></td>
</tr>
<tr>
<td>h. Farming/Agriculture, shifting cultivation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i. Cattle raising/cattle herding</td>
<td></td>
<td></td>
</tr>
<tr>
<td>j. Horticulture or vegetable gardening</td>
<td></td>
<td></td>
</tr>
<tr>
<td>k. Retailing or other small-scale business</td>
<td></td>
<td></td>
</tr>
<tr>
<td>l. Military</td>
<td></td>
<td></td>
</tr>
<tr>
<td>m. Service sector employee</td>
<td></td>
<td></td>
</tr>
<tr>
<td>n. Housekeeping, domestic work</td>
<td></td>
<td></td>
</tr>
<tr>
<td>o. Cottage industry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p. Handicraft</td>
<td></td>
<td></td>
</tr>
<tr>
<td>q. Others, specify</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

B3. How many hours do you normally work per week in:

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Main</th>
<th>Additional/Subsidiary</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Main occupation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Additional/subsidiary occupation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

B4. How old were you when you started working in your current occupation? ____________
C. MIGRATION/PREVIOUS RESIDENCE

C1. In what barangay/municipality did you reside five years ago? ________________
C2. In what barangay/municipality did you live before moving to your present residence? ________________
C3. When did you move to your present residence? ________________

D. OCCUPATION AND INTERGENERATIONAL MOBILITY

D1. What was the highest level of schooling your father attended?
   a. Did not attend school
   b. Elementary/Primary school
   c. Secondary school
   d. Vocational or technical school
   e. College or university
   f. I don’t know

D2. When you were growing up, what kind of work was your father mainly doing?
   a. Fish catching with boats in open sea
   b. Fish catching along shores
   c. Fish farming
   d. Fish marketing
   e. Fish processing
   f. Boat building/construction
   g. Farming/Agriculture on permanent plots
   h. Farming/Agriculture, shifting cultivation
   i. Cattle raising/cattle herding
   j. Horticulture or vegetable gardening
   k. Retailing or other small-scale business
   l. Military
   m. Service sector employee
   n. Housekeeping, domestic work
   o. Cottage industry
   p. Handicraft
   q. Others, specify ________________

D3. If you have or would have a son, would you advise him to do the same work/occupation you are doing?
   a. Yes, because ________________
   b. No, because ________________

E. FERTILITY AND FAMILY PLANNING
   (for females aged 15–49 only)

E1. Have you ever given birth? _____Yes _____No
E2. How many children have been born alive to you? ______
E3. How many are still living? ______
E4. How many children were born alive to you in the past twelve months? ______
E5. How old were you when you first got married? ______
E6. Are you aware of any family planning methods? _____Yes _____No
E7. Do you know where to get or avail of family planning services? _____Yes _____No
E8. Are you currently using any method of contraception? _____Yes _____No
E9. Have you ever availed of any family planning service? _____Yes _____No

   Where?
   a. Government ________________
   b. Private ________________
## F. Gender Roles: Activity and Work Profile

<table>
<thead>
<tr>
<th>Activity</th>
<th>Adult Male</th>
<th>Young Male</th>
<th>Adult Female</th>
<th>Young Female</th>
</tr>
</thead>
</table>
### F1. Productive

#### F1.1 Fishing
- a. Fish capture
- b. Fish processing
- c. Fish vending/marketing
- d. Preparing gears/nets for fishing
- e. Shell and fry gathering/glean ing
- f. Mending nets and other gears
- g. Mariculture
- h. Others, specify ___________

#### F1.2 Farming
- a. Land preparation
- b. Planting
- c. Fertilizing
- d. Pesticide application
- e. Herbicide application
- f. Weeding
- g. Cutting
- h. Threshing
- i. Drying
- j. Backyard/home gardening
- k. Marketing/selling
- l. Others, specify ___________

#### F1.3 Other Livelihood Activities
- a. Small-scale business
- b. Sari-sari/retail store
- c. Handicrafts
- d. Backyard poultry/piggery
- e. Others, specify ___________

### F2. Reproductive
- a. Child care
- b. Food preparation/cooking
- c. Laundry
- d. Dishwashing
- e. House cleaning
- f. Water fetching
- g. Others, specify ___________

### F3. Community Management

#### F3.1 Membership in organizations
- a. Fishermen's/women’s associations
- b. Cooperatives
- c. FARMCs
- d. Barangay/development councils

#### F3.2 Attendance to village/community meetings

#### F3.3 Attendance to training/seminars

#### F3.4 Community volunteers
- a. Day care
- b. Nutrition/feeding programmes
- c. Church activities
- d. Deputies/fish wardens/fishery law enforcers
- e. Others, specify ___________
Part 2

Summary of proceedings and recommendations

of the Regional Workshop on the Use of Demographic Data in Fisheries and Coastal Development and Management in the Philippines and other Southeast and South Asian Countries

Iloilo, Philippines, 18–21 March 2002

1. BACKGROUND, PURPOSE AND PARTICIPATION

In the two previous workshops held for the interregional project Strengthening of Research and Training in Population and Development Dynamics in Rural Fishing Communities (FPA/INT/695/FPA), recommendations were put forward for the integration and consideration of population-related issues in fisheries planning and management. Among others, the inclusion of demographic components in integrated coastal area management and the strengthening of the collection, analysis and dissemination of demographic and socio-economic data and information on fishing communities were endorsed.

As a follow-up action, this workshop was held in recognition of the need to have a comprehensive understanding and appreciation of specific social and demographic factors in fisheries planning and management. The main purpose of this workshop was to devise mechanisms for the regular and cost effective extraction and analysis of demographic data on coastal fisherfolk in Southeast and South Asia, and for their use in fisheries development and management.

Experts from the University of the Philippines in the Visayas (UPV), University of San Carlos (USC), Bicol University (BU), the Bureau of Fisheries and Aquatic Resources (BFAR), Population Commission (POPCOM), local government units and other agencies involved in the development and management of coastal resources of the Philippines attended the workshop.

Other participants included experts from the Food and Agriculture Organization of the United Nations (FAO), resource persons from other Southeast and South Asian countries such as Myanmar, Thailand, Viet Nam, and Sri Lanka, and observers from international multilateral and bilateral development agencies. The complete list of participants is given in Annex 2.

2. PROCEEDINGS

Several speakers who gave messages welcoming the participants graced the opening programme. This was followed by a presentation from the UPV, which hosted the workshop, about its present and future role in coastal resource management in the Philippines.

To set the tone and focus of the workshop, presentations were given by experts from FAO Rome on the need for fisheries management planning and demographic changes in coastal fishing communities and their implications for the coastal environment.

Presentations of several papers from the Philippines touching on policies, guidelines for monitoring socio-economic and demographic changes in fishing communities and case studies were made. This was followed by presentations from Viet Nam, Thailand, Myanmar and Sri Lanka on their respective fisheries and coastal management and development policies, and on
the consideration of socio-economic and demographic data in their countries.

Three working groups were later formed to formulate country-specific recommendations on the use of socio-economic and demographic information on coastal fisherfolk in coastal and fisheries development and management.

A field visit to the Banate Bay Resource Management Council in Banate, Iloilo was made on the fourth day.

2.1 Opening ceremony

In her brief opening remarks, Dr Jane Geduspan, Vice-Chancellor for Academic Affairs of UPV, warmly welcomed the participants. On behalf of the UPV, she said it was the university’s pleasure to host the workshop and wished the participants success in discussing areas of common goals and in initiating collaborative activities.

Dr Uwe Tietze, Fishery Industry Officer of FAO, extended a warm welcome to all the participants of the workshop. He cited the involvement of FAO in previous national and regional projects in the island of Panay, including the project involving women in fishing communities in the province of Capiz and the recently completed regional project on strengthening of research and training in population and development dynamics of rural fishing communities. He explained that the objective of the workshop was to review and discuss this methodology and make recommendations on how it can be implemented and adopted, given human and budgetary resources available at the country level. In concluding, he wished the workshop participants success and a pleasant stay in Iloilo.

Following Dr Tietze’s message, Dr Sang Mu Lee, FAO Representative in Manila, also welcomed the participants on behalf of FAO. He expressed FAO’s sincere appreciation for the support and assistance of the UPV in organizing the workshop. He stressed the need for a multifaceted approach to coastal resource management and for simultaneously undertaking within a single management framework the careful planning and management of all sectoral activities. He noted that given demographic and social changes such as those triggered by urbanization and industrialization, dependence on coastal resources is likely to remain strong. There is, therefore, a need for sound policies that in turn require sound information to especially address negative resource externalities arising from resource loss and ecosystem degradation. He wished workshop participants success and hoped that lessons and insights gained by participants from the workshop will contribute to better analysis and use of demographic data in fisheries.

For the final opening message, Dr Ida Siason, Chancellor of the UPV, echoed the warm welcome to the participants. She commended Dr Tietze in particular for organizing the workshop and FAO in general for the continued support it has provided UPV. She emphasized that the workshop provided a timely reality check on whether the human dimension is truly incorporated in fisheries management. In this regard, she highlighted women and gender issues as important considerations. She hoped that the workshop could set directions in better understanding the human resources in fisheries management in the effort to improve the well-being of fisherfolk.

After the introduction of participants, Dr Leonor Santos, chairperson of the organizing committee, extended her thanks to all and wished everybody a successful completion of the workshop.

2.2 Present and future role of the College of Fisheries and Ocean Sciences in fisheries and coastal resource management

The first paper of the technical session was a review of the present and future role of the College of Fisheries and Ocean Sciences (CFOS) in fisheries and coastal resource management, presented by Dr Glenn Aguilar, Vice-Chancellor for Planning and Management of the UPV. Dr Aguilar first described the current situation of Philippine fisheries, of critical habitats and of coastal resource management. The operations and nature of the CFOS, including its expertise and research activities, were then discussed and an effort was made to match the plans of the College with perceived challenges.

Following Dr Aguilar’s presentation, concerns and suggestions were raised regarding the translation of academic research findings into more operational and understandable forms that would benefit the end users of such research. Apart from the need for a more relevant analysis of research results that are contextualised in local settings, the need to disseminate and promote the utilization of research results was strongly endorsed. In this regard, the following were
suggested: that donors include a budget for this purpose or that research institutions raise the funds themselves; that donors insist that research objectives explicitly state how research results are to be utilized; that linkages with local government units be activated (e.g. by tapping the Information, Education and Communication programmes of such units) thus creating an atmosphere of sharing with end users.

2.3 Status of coastal fisheries management in South and Southeast Asia: the need for management planning and the FAO Technical guidelines for responsible fisheries No. 3: Integration of fisheries into coastal area management

Dr Purwito Martosubroto of the Fisheries Resources Division in Rome presented two papers. Setting the tone for the workshop with his first presentation, Dr Martosubroto reviewed the status of coastal fisheries management in South and Southeast Asia and the need for management planning in the light of the problems and issues facing the sector. The presentation started with a review of the status of marine fisheries catch and exports, then proceeded to discuss the status of fisheries management in the region. Dr Martosubroto identified a number of issues confronting fisheries management. These include: overexploitation, the open access regime, inadequate law enforcement, the large number of fishers, the lack of job alternatives, inadequate management-oriented research, lack of participation of the stakeholders and inadequate database management. In this regard, he informed the workshop participants of the several guidelines produced by FAO that can provide guidance in strengthening the implementation of responsible fisheries as well as those that promote the participation of the different stakeholders in fisheries management planning.

In conclusion, Dr Martosubroto emphasized that a good demographic profile of fishing communities, information on the resources being exploited, a well established legal and institutional framework and the presence of strong fishers’ associations constitute important bases and elements for the development of an effective fisheries management plan.

In the discussion following Dr Martosubroto’s presentation, attention was drawn to the inclusion of monitoring and evaluation as an important component in a fishery management plan, and to the involvement of stakeholders, particularly the local leadership, in the planning process itself. He also stressed the vital role strong organizations play in the implementation of fisheries management plans. In the Philippines, the Fisheries and Aquatic Resource Management Councils (FARMCs) can serve as a model of organizations at the local levels that institutionalise the role of local fisherfolk in coastal resource management.

In the presentation of his second paper, Dr Martosubroto summarized the relevant FAO guidelines on integrating fisheries into coastal area management in the following areas: institutional framework, policy measures, regional cooperation and implementation mechanisms. The guidelines served as explanatory material to Article 10 in the Code of Conduct for Responsible Fisheries. They addressed the issue of how the fisheries sector can be integrated into coastal management planning so that interactions between the fisheries sector and other sectors can be taken into account in the establishment of management policy and practice with regard to coastal resources.

In the ensuing discussion, the importance of adopting multidisciplinary and holistic approaches and mechanisms in the planning and management of coastal resources were underscored. There is a need for an integrated agency to manage all aspects of coastal area management. An example in the Philippines was mentioned regarding the issue of jurisdiction arising from conflicts between two sectoral agencies, i.e. the fisheries department and the environment department. In this regard, a participant proposed the creation of a more integrated Department of Fisheries and Oceans in view of the fact that “fisheries cannot be separated or divorced from their habitats”.

Dr Martosubroto clarified that regionalization of the Code to better respond to local situations and contexts is encouraged as long as the objectives are maintained. Research institutions have taken the lead in Southeast Asia to better integrate research results into the fisheries planning and management process.

2.4 Demographic change in coastal fishing communities and its implications for the coastal environment

Dr Uwe Tietze, FAO Fishery Industry Officer, presented a summary of findings carried out under the UNFPA/FAO regional project Strengthening of Research and Training on Population and Development Dynamics of Rural Fishing Communities involving six countries—
Philippines, Malaysia, Bangladesh, India, Tanzania and Senegal. Dr Tietze reported that while the global trend in the number of coastal fishers is still increasing; it has started to decline in four of the six countries studied. In India and Bangladesh, the number of coastal fishers is still on the increase but at a slower rate. These changes could not be primarily explained by demographic factors, but could be partly attributable to growing economies in these countries as well as rising education levels and the presence of alternative livelihood opportunities outside the fisheries sector.

Regarding intergenerational occupational mobility, Dr Tietze said that the findings of the study suggested that artisanal fishing is no longer seen as a “last resort employment” and that there is movement out of fishing into other occupations in the service sector or into unemployment. He also discussed the relevant demographic changes and characteristics such as fertility and mortality in the studied communities. An important point brought out by Dr Tietze was that in addition to demographic factors, changes in the main and secondary livelihoods of rural households and the successful implementation of livelihood diversification strategies would impact on the number of coastal fishers.

Dr Tietze ended his lecture with some policy options relating to an overall approach that would integrate population, health and welfare programmes with fisheries development and management actions. He stressed that the formulation of both fisheries and population policies requires reliable statistics on fisherfolk. He also presented the recommendations of an earlier workshop on population characteristics and change in coastal fishing communities, held in India on 10–14 March 1997, as a basis for coming up with related and more specific follow-up recommendations and project proposals for the workshop groups to deliberate on.

In the ensuing discussion, a question was raised as to whether the findings of the regional research project involving the Philippines could be representative of a country trend. Dr Tietze clarified that the findings covered only the sampled communities in one municipality in the province. It was also suggested that along with integrating population and development concerns, multisectoral planning involving different agencies in the planning process be promoted. Dr Tietze agreed and added that a sharing and exchange of experiences and information with other parts of the world could be an area for possible follow-up activities.

2.5 The use of demographic data in fisheries and coastal management and development policies and programmes

2.5.1 Philippines

*Fisheries and coastal management in the Philippines*

Ms Jessica Muñoz of the Bureau of Fisheries and Aquatic Resources reviewed the fisheries and coastal resource management policies and programmes in the Philippines. She described the state of the coastal habitat and fisheries resources of the country and underscored how increasing population greatly contributed to resource depletion. National policies and directives embodied in various laws as well as international treaties relevant to coastal resource management were highlighted as the bases for the pursuance of goals and strategies for the conservation and management of the country’s fishery resources, poverty alleviation and food security.

The evolution of various coastal resource management programmes were indicated as interventions designed to address issues on resource depletion and poverty. The roles played by major stakeholders such as Local Government Units (LGUs), Non-Government Organizations (NGOs), People’s Organizations (POs) and FARMC’s were emphasized. The Asian Development Bank-funded *Fishery Resource Management Project* was briefly discussed, with particular focus on its three major components of fishery resource management, income diversification, and capacity building.

In the discussion, questions were raised regarding the reliability and accuracy of the fishery statistics that Ms Muñoz presented in particular, and the quality of fisheries statistical information in the country in general. The questions referred to statistics on number of fishers, definitions of part-time and full-time fishers, and the undercounting and double counting of the same. In response, Ms Muñoz admitted that much still needed to be done towards improving the generation and collection of fishery statistics and further clarifying the definitions used. The lack of staff and capabilities to collect fishery information are major constraints. One suggestion was to intensify the efforts of the National FARMC Secretariat based in Manila to complete the nationwide registry of municipal fishers.

A point was made that carefully delineated the scope of fisheries management plans (covering 15 kilometres from the coast of municipal waters and beyond) against the scope of coastal resource management plans (only covering less than 15 kilometres from the coast of municipal waters).
**Current approaches in fishery and coastal resource appraisal and the need for inclusion of demographic data**

Professor Nygiel Armada of the CFOS presented some current approaches in fishery resource assessment appraisal in the Philippines and the need for inclusion of demographic information. He noted that demographic data was limited to the assessment of income levels, earning capacity from the fisheries, or capacity and preparedness to carry out supplemental livelihood activities. In the context of resource assessment appraisal, he posed a hypothetical question on whether fishery resource management strategies would have been different had demographic information been integrated at the appraisal stage. Additionally, would management options offered be greatly influenced by changes in demographic structure? He conceded that there were no clear-cut answers to these questions.

In the discussion, some clarifications were made on the scope of demographic information, which is mainly equated with population trends. Demographic information should more specifically refer to demographic processes pertaining to fertility, mortality and migration, which lead to population outcomes such as population size, age-sex structure and spatial distribution. As regards the relevance of demographic information at the resource assessment appraisal stage, a suggestion that could be further taken up as a follow-up recommendation was made to include this dimension in bioeconomic modelling.

**Monitoring socio-economic and demographic change in coastal fishing communities in the Philippines**

Ms Lolita Villareal, FAO Consultant, presented a summary of the paper she wrote for FAO titled *Monitoring socio-economic and demographic change in coastal fishing communities in the Philippines*. She began her presentation by underscoring the need to have a sound knowledge of the socio-demographic characteristics of fishing communities for effective fisheries planning and management. The guidelines contained in her paper, she explained, are intended to provide a general framework that can be used to identify and monitor those social and demographic characteristics which affect the status of fisheries and aquatic resources and the coastal environment, and/or which are negatively or positively affected by management decisions. The guidelines focused on monitoring socio-economic and demographic indicators using available secondary information as well as resorting to primary data collection in the absence of information at the desired level (i.e. at community level which is critical for community-based coastal resource management).

Ms Villareal then briefly described the population-development framework being institutionalised at the local levels in the Philippines. The framework underscored the interrelationships between and among population and development variables – i.e. demographic processes affecting socio-economic outcomes and socio-economic processes affecting demographic outcomes, at the macro and micro levels. Applying this framework, socio-economic and demographic indicators were identified. A recommended list of 109 core indicators were identified by the national and sectoral government agencies. From this list, around 28 process and outcome indicators that may be relevant for coastal resource management were selected. Ms Villareal clarified that the indicators were meant to serve as some sort of ‘shopping list’ of available secondary data that planners can choose from, depending on their requirements and circumstances. Guidelines, by way of sample household and individual schedules, to elicit the required information at the community level were briefly explained. Finally, data processing and maintenance can be carried out using an appropriate and user-friendly computer software.

In the discussion, a question was raised on whether census data listed fishing as an occupation and on the possibility of extracting other information pertaining to those who listed it as such. Fishing as an occupation is lumped under agriculture, with no further disaggregation as to specific subcategories such as aquaculture, municipal fisheries and commercial fisheries. With regard to extracting other information, it was not certain if this is at all possible given that this would constitute referring back to raw data/information which the census office might not be inclined or be in a position to immediately provide. A question on the existence of an identification system for fishers in the country was also raised. The response was that, as a national policy, there is no existing identification system for the Philippines; however, a marine registry is being implemented at the FARMC level. When completed, the marine registry would provide a more accurate picture of the actual number of fishers in the country.
Case study from three coastal communities in Central Visayas, Philippines

Dr Filipina Sotto, a biologist from the University of San Carlos in Cebu City, Philippines, presented a case study on the use of demographic data in three coastal communities in Central Visayas in the Philippines. The objective of her presentation was to highlight the importance of collecting demographic and socio-economic data and their use in designing interventions for coastal resource management. She stressed the need for the collaborative efforts of practitioners from the different sectors in this regard.

A spirited discussion followed Dr Sotto’s presentation and brought out several issues critical to coastal resource management. First was the need to be sensitive to, conscious of and respectful of indigenous practices in the communities being assisted. Second was the importance of providing information on family planning and reproductive health as a complementary effort to ease population pressure on fishery resources. Pertinent legislations on population–development concerns are, however, still pending in the Philippine Congress. A third issue concerned migration in multiple island systems. In order to manage coastal resources, there has to be a mechanism in place to manage migration as well. Unfortunately, in the Philippine context, there is free movement of people between and within the islands. Quite apart from the practical difficulties of regulating migration, new legislation may need to be passed.

Visayan Sea Coastal and Fisheries Resources Management Project (VisSea)

Dr Rudolf Hermes, Senior Research Fellow of CIM/GTZ/PCAMRD, presented the VisSea project. This project, which is still in the pre-implementation stage, intends to bring together different stakeholders to work for the effective management of the renewable resources of the Visayan Sea. To be funded by GTZ and implemented by LGUs of 22 municipalities/cities in four provinces located in three regions of the country, the project hopes to achieve the following results: a joint management plan, provision of alternative income-generating opportunities, implementation of improved coastal resource management practices, and setting up of an information database for a resource management and networking system among the various stakeholders. As regards the setting up of an information database, Dr Hermes informed the body of the timeliness of his participation in the workshop, as he would ensure the inclusion of the socio-economic and demographic indicators discussed in Ms Villareal’s paper in the preparation of baseline data and in the monitoring of project impact.

Following Dr Hermes’ presentation, the discussion focused on a number of issues, providing valuable inputs to be taken into consideration at this stage of the project. First is the setting up of a mechanism that would enable and ensure the participation of all the stakeholders, including commercial and industrial fisheries, the academe, the business sector, NGOs and people’s organizations. Second was the caution needed in organizing a management council that would oversee the implementation of the project. Past experience has not proven the setting up of management councils as being effective and efficient. Dr Hermes responded that it was not intended that a parallel management structure be formed. One will be constituted only when the stakeholders see the need for it. Finally, the sustainability issue was again emphasized, with the recommendation that the LGUs be made the lead implementors of the proposed project.

2.5.2 Viet Nam

Dr Thai Thanh Duong, Director of the Fisheries Information Centre (FICen) of Viet Nam, presented the management policies and programmes on fisheries development that aimed to enhance socio-economic conditions and improve people’s livelihood in Viet Nam’s coastal areas. He began his presentation with an overview of the development of the fisheries sector in terms of production and its increasing contribution to the economy, particularly through job creation and export earnings. Such contributions were a result of the successful implementation of a strategy of sustainable fisheries development along with socio-economic policies and programmes. He cited the most important ones as the policy on the development of offshore fishing and stabilization of inshore fishing, the programme on the development of aquaculture and the programme on the development of fisheries exports.

Dr Duong highlighted the importance of demographic data in designing socio-economic programmes and fisheries planning and management: The human resource is not merely the target but also the decisive factor in the successful implementation of such programmes. In the discussion, a question on the structure of fisheries management in Viet Nam, particularly on how local bodies related to the national government, was raised. Dr Duong responded that policy-making is undertaken at the national level and that systems are still being strengthened for
local communities to relate more directly to the national government. In terms of statistics, the Vietnamese General Statistics Office has offices and units in every province down to the community level. A census in agriculture that includes fisheries will be published by end of 2002.

Dr. Duong elaborated on the role of women in aquaculture. He explained that women’s role in Viet Nam’s social and economic life was enhanced by their involvement in aquaculture activities. He informed the group of the recent establishment of the Mekong River Network of Women in Fisheries that could further support and improve women’s involvement in fisheries.

Dr. Duong was asked about the status of the development of offshore fishing in Viet Nam, particularly the success of government investments in the sector. He pointed out that the government provided credit assistance to fishers for building larger fishing boats. Presently, however, there are concerns about repayment of those loans.

2.5.3 Thailand

Dr. Somying Piumsombum, Senior Fisheries Economics Expert, Department of Fisheries in Bangkok, presented the state of fisheries and demographic data in Thailand. She reported that Thailand was one of the top fish producing nations in the world. Over 70 percent of this production came from marine capture fisheries. However, overfishing and the consequent resource deterioration are pressing concerns. Thailand has also ranked as the top exporter of edible fisheries products in the world since 1993.

Dr. Piumsombum elaborated on Thailand’s National Fisheries Development Policy covering five policy areas, namely: the development of fisheries organizations; the management of fisheries resources and the environment; aquaculture development; overseas fisheries development; and fisheries industry development.

Regarding demographic and socio-economic data, Dr. Piumsombum presented a summary of the results of the marine fisheries census and of the intercensal survey on marine fisheries covering the period 1985–2000, that were conducted jointly by the National Statistics Office and the Department of Fisheries. Selected statistics from the household survey of small-scale marine capture fishery for the period 1990–2000 were also presented.

In the discussion, a question was asked whether there was further disaggregation by sex in the household survey and where women’s participation was highest. Dr. Piumsombum responded that the household survey data was disaggregated by sex and that women’s participation was highest in fish processing with a small number in aquaculture. It was suggested that, in future, fish caught outside Thai waters be separated from total catch of marine capture fishery as this would have implications on stock assessment.

2.5.4 Myanmar

The participant from Myanmar, Mr. Ohn Maung, Assistant Director, Department of Fisheries of Myanmar, presented the status of marine fisheries in his country. Marine fisheries, which include both inshore and offshore fisheries, contribute over 60 percent to total fish production. Mr. Maung reported that the rapid progress and developments in fisheries have resulted in the emergence of the sector as a significant contributor to nutritional and food security, employment, foreign exchange and overall socio-economic development. The good growth potential and the high demand for fish have also made the sector attract investments. The fisheries sector is Myanmar’s fourth largest foreign exchange earner after timber, minerals and rice. Shrimp is its most important fisheries export.

Mr. Maung enumerated the different fisheries management measures being implemented by the Department of Fisheries (DOF). The overall policy is to encourage the expansion of marine fisheries and freshwater aquaculture with the goal of improving the socio-economic status of fishing communities. The government also plans to go into joint ventures with foreign companies and strongly encourages private sector initiatives in the development of the sector.

The Myanmar DOF has not undertaken a nationwide collection of socio-economic and demographic data on coastal fishing communities. Mr. Maung attributed this to the lack of trained human resources and limited financial resources. He welcomed close coordination and collaboration with regional and international organizations on this effort.

After Mr. Maung’s presentation, a question was raised on the reported total number of fishers of 2.6 million that are directly involved in fishing, given that there were only around 25,000 fishing boats in inshore areas. It was suggested that there be further qualifications on this information to more accurately reflect the reality of the situation. Mr. Maung was also asked about Myanmar’s
experience in fishery law enforcement, particularly with reference to violations and apprehensions. Mr Maung responded that regular checks are conducted along this line.

2.5.5 Sri Lanka

Mr Ginigaddarage Piyasena, Director-General of the Department of Fisheries and Aquatic Resources of Sri Lanka, provided an overview of the current fisheries and coastal management and development policies in his country. Embodied in the Coastal Zone Management Plan of 2000, the current fisheries and ocean resources policies and strategies placed strong emphasis on fisheries management and development, poverty alleviation, coastal conservation and environmental protection. Mr Piyasena reported that the ultimate goal of the policies and strategies was to provide Sri Lankans with nutrition, food security and income-earning opportunities. The open-access nature of fisheries, however, remained as the major constraint to sound resource management practices in the coastal areas, resulting in resource depletion, habitat destruction, declining bio-diversity and environmental pollution.

As regards socio-economic and demographic information, Mr Piyasena noted the limited availability of data in his country. The reliability of the methods of data collection was also at question. He therefore recommended developing a reliable database and socio-economic profiles as essential elements in the formulation of sound resource management policies.

In the discussion, Mr Piyasena was asked what was the reason for the reported big decrease in the number of fishing boats. He explained that the reduction in the number of fishing boats was the result of the recent introduction of multiday fishing boats that replaced the day fishing boats. The shift from day fishing to multiday fishing involved the outfitting of boats with either an outboard or inboard engine and the introduction of more modern navigational, communication and fish landing equipment. As regards coastal erosion problems in Sri Lanka, Mr Piyasena reported that the government has embarked on coastal nourishment programmes to address this concern.

2.6 Some observations and challenges for action from a multilateral agency

On behalf of multilateral and bilateral agencies that attended the workshop, Dr Boris Fabres, Officer-in-Charge of the ICLARM Philippine Office, presented some observations on the focus and content of the workshop and recommended specific challenges for action. He first recognized the importance of managing data as being equal to the importance of the data content. As the information exchange and data consolidation for fisheries and coastal zone management are still inadequate, he endorsed the design of simple, realistic but informative databases and information systems. This with the caveat that duplication is avoided and that the sustainability of these systems is carefully looked into. In this regard, a national workshop or meeting of institutions that maintain databases and information systems for coastal resource management is being planned by UPV to precisely discuss the state of the art and explore collaborative, coordinative and complementary mechanisms. Finally, Dr Fabres challenged the group, particularly the academe, to eventually venture into modelling and consequently go into a model-driven data collection of the effects and impacts of fisheries management interventions.

3. DISCUSSION AND ADOPTION OF WORKSHOP RECOMMENDATIONS

Three working groups were formed to deliberate and propose recommendations on the use of socio-economic and demographic information on coastal fisherfolk in coastal and fisheries development and management. The Philippine contingent was divided into two groups, one of which constituted participants from LGUs and provincial planning bodies. The third group was composed mainly of participants from the other South and Southeast Asian countries, namely Sri Lanka, Thailand, Myanmar and Viet Nam. The working groups were guided by the following terms of reference:

A. Extraction of socio-economic and demographic data from other sources and surveys (secondary data collection): Which types of data suggested by Ms L. Villareal can be extracted and which cannot be extracted?

- Can the data be obtained from the sources suggested or not?
- In case they cannot be collected from the suggested sources, can they be collected from other sources? If yes, which ones?
- Who would extract the data and how often/frequently?
- Who should cover the cost of data extraction?
- Is qualified staff available to extract data or is there a need for training?
- If there is a need for training, who should conduct training and who should fund it?
B. Primary data collection

- Which of the data suggested in Ms Villareal’s paper should/could be collected and which not?
- Who should collect the data?
- Is there qualified staff available or can work be subcontracted?
- Are funds available for primary data collection/survey?
- Are the methodologies for data collection suggested in Ms Villareal’s paper appropriate?

C. Use of data

- Which institutions and organizations should review and use the data collected through secondary and primary collection methods?
- How should the institutions/organizations identified cooperate in the review and use of data and who should take the lead?
- Feedback between data collectors, users and coastal fishing communities: What arrangement/mechanism for feedback is proposed?
- Technical assistance needs and support from FAO and other specification of what further support is needed for the implementation of a regular programme of collection and use of socio-economic and demographic information on fishing communities.

The working group fully realizes and recognizes the need for socio-economic and demographic information for coastal resource management, particularly community-based coastal resource management. In this regard, it subscribes to the framework discussed in Ms Villareal’s paper and endorses all the core indicators identified/arising from the framework as being equally important and needing to be gathered/extracted through secondary and primary data collection methods. The group believes that the information to be collected can be used for new and ongoing projects as well as for comprehensive local level planning processes.

Secondary data collection

The working group believes that for data available at the province level, data can be obtained from the sources identified and specified by Ms Villareal’s paper. For further disaggregation to municipal and barangay levels, however, data can be obtained at the first point of consolidation, i.e. Barangay Health Stations, Barangay Health Workers (BHWs), Barangay Service Point Officers (BSPOs), Rural Health Midwife (for nutrition, health and family planning information) and local civil registries. If they are not available from these sources, there might be a need to collect primary data.

At the local level, the LGUs, particularly the Municipal Planning and Development Officers (MPDOs), will have primary responsibility for extracting the data from the specified sources. LGUs can bear the cost of data extraction from their development funds. Training on data collection, processing and particularly data analysis will need to be provided for the local staff and this can be sourced through foreign assistance.

Primary Data Collection

The working group recognizes the importance of securing accurate information at the lowest area/domain whenever possible. This becomes even more critical when planning community-based coastal resource management interventions and measures. Thus, critical variables pertaining to migration, intergenerational and occupational mobility, alternative livelihood and identification of gender roles that are not generally available through secondary sources may need to be collected at the community level through primary data collection methods. In this connection, the primary project proponents and users may have to...
gather the data themselves, using sampling procedures appropriate to project requirements. Educational and research institutions can also be contracted for this purpose. At this level, training on data analysis and interpretation and on participatory appraisal methods needs to be provided.

Use of Data
All stakeholders – LGUs, POs, NGOs, project proponents, FARMCs, research institutions, the academe and other GOs involved in coastal resource management and development, can use the data collected. A feedback mechanism through meetings, assemblies and consultations of all those involved should be conducted whenever appropriate. At the municipal level, the Municipal Development Councils can be channels for such consultations. At the community level, Barangay FARMCs can be utilized as lead organizations, as around 50 percent of total barangays in the country have already been organized into BFARMCs.

Technical assistance needs and proposals
The working group proposed two pilot projects requiring technical assistance:

1. Piloting the Development of a Community-based Information System for CRM for LGUs

Objective:
• To standardize and institutionalise the collection, processing and analysis of socio-economic and demographic information for CRM

Activities:
• Training of trainors (MPDOs, MAOs)
• Training of data collectors (BHWs, BSPOs)
• Data collection at pilot sites
• Database development
• Data consolidation, processing, analysis
• Data utilization and dissemination

Expected outcomes:
• Training manuals
• Standardized procedures/procedural manual on profile analysis
• Computer software for data processing and maintenance
• A core of trained trainors
• Consolidated data/reports ready for dissemination

Expected assistance from donor:
• Funds for hiring systems analyst and programmer
• Funds for training, data collection activities
• Funds for technical consultants such as a demographer, CRM specialist, overall project coordinator

2. Short-term COAST-HAVEN Baywide Management Council Plan for Anini-y, San Jose, Tobias Porrner, Hamtic (in Antique province, Panay Island, Philippines)

Objectives:
• To demonstrate the use of POPDEV indicators for CRM planning
• To establish monitoring and evaluation mechanisms to measure the effect/impact of programmes/projects relative to identified POPDEV indicators
• To determine the influence of such capability building measures in institutional sustainability

Activities:
• Situational analysis per municipality
• Data gathering for information gaps
• Multilevel-stakeholder policy and planning consultation
• Plan formulation
• Monitoring of plan implementation
• Evaluation of programme/project effects and impacts based on POPDEV indicators

Expected outcomes:
• POPDEV concerns incorporated in the plan document
• Effect/impact of intervention schemes relative to POPDEV indicators measured
• Adoption and internalization of planning process

Expected assistance from donors:
• Funding and technical assistance in data gathering, analysis, plan formulation and monitoring and evaluation

Working Group 2 (Philippine LGU group)

Chairperson:
Mr Alexander Benedicto, PPDO, Zamboanga Sibugay

Rapporteur:
Ms Luzviminda Muego, Provincial Population Officer, Pangasinan

Members:
Ms Evelyn Ame, BFAR Region II
Dr Ignacio Arat, POPCOM, Region IX
Dr Evelyn Belleza, UPV
Ms Elsa Cabuhay, Provincial Population Officer, Capiz
Mr Robert Espinosa, BFAR Region VI
Dr Purwito Martosubroto, FAO Rome
Dr Enrico Villosko, UPV
Introduction

There was consensus in the working group that almost all the data can be generated/sourced at the LGU level – provincial, municipal/city or barangay. However, the reliability of the data from these sources is a major concern because of the following factors:

a. data come from different sources – there are many offices at the local level that collect data as part of their respective data banks for monitoring and evaluation purposes;

b. there are different methods of data collection which may affect the consistency of the data, e.g. comparing the same data gathered from two different surveys using different methodologies (such as the Contraceptive Prevalence Rate for Family Planning which has two different sources – the Multi-indicator Cluster Survey and the Demographic Health Survey); and

c. capability of the agency/person doing the data gathering.

Secondary data collection

The working group adopted all the types of data indicated in Ms Villareal’s paper and improved on some, specifically:

- For the lowest area domain, indicators for mortality and migration need to be collected at the municipality and barangay levels.
- Indicators for morbidity should be included in order to monitor health problems and leading causes of illnesses and deaths that may be related to the occupation of fisherfolk.
- Additional agencies as sources of data were identified. These are the population, health, planning and local civil registrar offices.
- One indicator that may be difficult to get at the municipal level was identified – life expectancy at birth.
- Data on migration can be derived from National Statistics Office but, at the local level, primary data on “push and pull” factors can be relevant and may therefore need to be collected.
- Population structure should be sex disaggregated and should also include women’s reproductive age range of 15–49 years.
- Whenever applicable, socio-economic indicators should be sex disaggregated.

Primary data collection

The collection of primary data is possible depending on the existing structure, human and financial resources of the LGU. For example, the presence of population, health and planning officers at these levels may facilitate the extraction of data. Subcontracting to appropriate institutions for data collection can also be financed out of LGU funds or through other donors.

Use of data

At the LGU level, the planning and population officers will be the lead officers in data consolidation and analysis. Feedback will be through consultations, workshop/meetings, utilizing existing mechanisms such as local development councils and other special bodies. As for technical assistance needs from FAO, the group identified the need for assistance in the setting-up of an information and management system specifically for community-based coastal resource management.

Working Group 3 (Participants from other countries)

Chairperson:
Mr G. Piyasena, Director-General, Department of Fisheries and Aquatic Resources, Sri Lanka

Rapporteur:
Dr U. Tietze, Fishery Industry Officer, FAO Rome

Members:
Dr Thai Tanh Duong, Director, Fisheries Information Centre, Ministry of Fisheries, Viet Nam
Dr Somying Piumsombun, Senior Fisheries Economics Advisor, Ministry of Agriculture and Cooperatives, Thailand
Mr Ohn Maung, Assistant Director, Department of Fisheries, Ministry of Livestock and Fisheries, Myanmar
Dr Glenn Aguilar, Vice Chancellor for Planning and Development, UPV
Ms Jessica Muñoz, Fisheries Resource Management Programme, BFAR
Dr Filippina Sotto, Department of Biology, University of San Carlos

Collection and Use of Demographic Indicators in Fisheries and Coastal Management and Planning

The working group fully endorses article 10.2.4 of the Code of Conduct for Responsible Fisheries, which stipulates that States in accordance with their capacities should establish systems to monitor the coastal environment as part of their coastal management process, using among other things economic and social parameters.
The working group also endorses the FAO Technical Guidelines for Responsible Fisheries on the integration of fisheries in coastal area management, which further explains that economic and social parameters include population density, employment and unemployment, income levels, regional GDP, barriers to entry and exit of human occupations, resource allocation systems, occurrence of social conflict and levels of subsidy.

The working group further expresses appreciation of the work undertaken by FAO in preparation for this workshop to further specify and operationalise the above-mentioned economic and social indicators with the view to assist Governments in their application and use.

The working group reviewed the specified and operationalised socio-economic and demographic indicators contained in the paper prepared and presented in the workshop by Ms Lolita V. Villareal. The working group endorsed all indicators as important and very important and suggested that the information should either be extracted from existing databases (i.e. population censuses and demographic and health services), or collected by surveys to be organized by the Department of Fisheries or obtained by asking other agencies to include questions relevant to fisherfolk in their questionnaires and survey schedules.

The demographic and socio-economic information should then be used to guide and orient fisheries and coastal development programmes by focusing government and civil service assistance and support on vulnerable groups in coastal areas. Demographic and socio-economic indicators should further be used to measure the impact of fisheries and coastal management and development programmes and activities on the socio-economic and demographic status of coastal and fishing communities.

In addition to its use by fisheries administrations, the information should also be used to guide the programmes and activities of other government agencies and authorities concerned with the well-being, health, education, employment and infrastructure of fishing and other coastal communities as well as by stakeholder organizations and NGOs.

With reference to pages 19–32 of Ms Villareal’s paper, the following indicators were endorsed:

**Demographic indicators:**
- IMPORTANT: fertility and mortality indicators such as crude birth rate, age specific fertility rate, total fertility rate, crude death rate, life expectancy at birth, infant mortality rate, maternal mortality rate.
- VERY IMPORTANT: geographic mobility and population indicators such as in-migration rate/out-migration rate, population growth rate, sex ratio, percentage of households by sex of head of household, percentage of population aged under 15 years, 15–64 years and 65 years and over, household size, population density, population growth rate.

**Socio-economic indicators:**
- VERY IMPORTANT: labour, employment and income indicators such as labour force participation rate, unemployment rate, average family income, per capita income; education and literacy indicators such as percentage of men and women by schooling completed, functional literacy rate.
- IMPORTANT: health and sanitation indicators such as percentage of households which availed of health care services, percentage of households with sanitary toilet facilities, percentage of households with safe main source of drinking water; housing/household convenience indicators such as percentage of households with owned/rented or shared house or lot, percentage of households with house made of durable materials, percentage of households with electricity connection, percentage of households with radio/television/computer; family planning indicators such as percentage of households with access to family planning services and contraceptive prevalence rate.

**Follow-up activities and technical assistance needs and proposals**

The working group observed that in the case of Sri Lanka, Thailand and Viet Nam a considerable amount of socio-economic data has already been collected in the course of fisheries censuses and socio-economic surveys, which has not yet been properly analysed. These data need to be complemented by other socio-economic and demographic data that can be obtained from other government and research institutions. There is a need for an in-depth analysis of these data and for the presentation of the findings in a manner that is useful for fisheries and coastal area management, planning and development.
Annex 1

Programme

of the Regional Workshop on the Use of Demographic Data in Fisheries and Coastal Development and Management in the Philippines and other Southeast and South Asian Countries

Iloilo, Philippines, 18–21 March 2002

MONDAY, 18 MARCH

Morning

8:30  Plenary Session 1 (Chair: Prof. Caridad Jimenez)

Registration of participants

Opening Ceremony

Present and future role of the College of Fisheries and Ocean Sciences in fisheries and coastal resource management (Glenn D. Aguilar, UPV)

Coffee/Tea Break

Status of coastal fisheries management in South and Southeast Asia: The need for management planning (Purwito Martosubroto, FAO Rome)

Demographic change in coastal fishing communities and its implications for the coastal environment (Uwe Tietze, FAO Rome)

Afternoon

Group picture taking

1:00  Plenary Session 2 (Chair: Dr Ninfa Pelea)

Fisheries and coastal resource management in the Philippines (Jessica Muñoz, BFAR)

Current approaches in fishery resources appraisal and the need for inclusion of demographic information (Nygel B. Armada, UPV-CPOS)

Coffee/Tea Break

Monitoring socio-economic and demographic change in coastal fishing communities in the Philippines (Lolita V. Villareal)
TUESDAY, 19 MARCH

Morning

8:30  **Plenary Session 3 (Chair: Dr Crispino Saclauso)**

The use of demographic data in coastal communities in the Philippines: A case study of three island communities in Central Visayas (*Filippina Sotto, University of San Carlos*)

FAO technical guidelines for responsible fisheries: Integration of fisheries in coastal area management (*Purwito Martosubroto, FAO Rome*)

Management policies and programmes on fisheries development aimed to enhance socio-economic conditions and improve livelihood of inhabitants in Viet Nam’s coastal areas (*Thai Thanh Duong, Fisheries Information Centre*)

Coffee/Tea Break

The state of Thai fisheries and demographic data (*Somying Piumsombun, Department of Fisheries*)

Status of marine fisheries in Myanmar (*Ohn Maung, Ministry of Livestock and Fisheries*)

Afternoon

1:00  **Visayan Sea Coastal and Fisheries Resources Management Project (VisSea) (Rudolf Hermes, PCAMRD)**

Fisheries and coastal management and development policies and programmes in Sri Lanka and the consideration of socio-economic and demographic data (*Ginigiddarage Piyasena, Dept. of Fisheries and Aquatic Resources*)

**Working Group Discussion**

I: Medium-term action planning for extraction and use of demographic data in fisheries and coastal management and development in the Philippines

II: Medium-term action planning for extraction and use of demographic data in fisheries and coastal management and development in other Southeast and South Asian countries
WEDNESDAY, 20 MARCH

Morning

Tour of UPV Campus and CFOS facilities

10:00  **Plenary Session 4 (Chair: Prof. Nygiel Armada)**

Presentation and discussion of working group reports

Observations and presentations of multi- and bilateral development agencies, participants and observers

Afternoon

1:00  **Closing Ceremonies**

Tour of Miag-ao Town  *(Miag-ao Church is included in the UNESCO World Heritage List.)*

Visit to SEAFDEC facilities at Tigbauan, Iloilo

THURSDAY, 21 MARCH

**Study Tour**

Banate Bay Resource Management Council (Banate Bay, Iloilo)
Guidelines on the collection of demographic and socio-economic information on fishing communities

Annex 2

List of participants

of the Regional Workshop on the Use of Demographic Data in Fisheries and Coastal Development and Management in the Philippines and other Southeast and South Asian Countries

Iloilo, Philippines, 18–21 March 2002

FAO

**Dr Uwe Tietze**
Fishery Industry Officer, FAO
Viale delle Terme di Caracalla
00100 Rome, Italy

Dr Purwito Martosubroto
Fisheries Resources Officer, FAO
Viale delle Terme di Caracalla
00100 Rome, Italy

GTZ

Mr Marc Nolting
Project Adviser
GTZ – Integrated Community Based Coastal Zone Management Silago Bay (ICOM)
c/o Office of the Vice-Governor
Capitol Building, Southern Leyte
Maasin City, Philippines

INTERNATIONAL CENTER FOR LIVING AQUATIC RESOURCES MANAGEMENT (ICLARM)

**Dr Boris Fabres**
Officer-In-Charge
ICLARM – Philippine Office
c/o IRRI Collaboration Centre
4030 College, Los Baños
Laguna, Philippines

PHILIPPINE COUNCIL FOR AQUATIC AND MARINE RESEARCH AND DEVELOPMENT (PCAMRD)

**Dr Rudolf Hermes**
Senior Research Fellow
CIM/GTZ/PCAMRD
4030 Los Baños
Laguna, Philippines

Mr Alejandro Olandez, Jr.
Science Research Specialist II
Marine Research Division - PCAMRD
4030 Los Baños
Laguna, Philippines

CRMP – UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT (USAID)

**Mr William Jatulan**
Training Coordinator
CRMP–USAID
5th Floor, Cebu Intl. Finance Corp. Towers
J. Luna corner Humabon Sts
North Reclamation Area, Cebu City, Philippines

SEAFDEC – AQUACULTURE DEPARTMENT

Ms Didi Baticados
Senior Scientist
SEAFDEC–AQD
Tigbauan, Iloilo, Philippines

MYANMAR

Mr Ohn Maung
Assistant Director, Dept of Fisheries
Ministry of Livestock and Fisheries
Myanmar

SRI LANKA

Mr Ginigaddarage Piyasena
Director-General
Department of Fisheries and Aquatic Resources
Maligawatte, Colombo 10, Sri Lanka
Ms Elsa Cabuhay
Commission on Population Office
Province of Capiz
Provincial Capitol
5800 Roxas City, Philippines

Ms Gloria Diaz
NFARMC–BFAR
2nd Floor Estuar Bldg.
880 Quezon Avenue
Quezon City, Philippines

Ms Visa Dimerin
Chief Aquaculturist
BFAR Region XII
Bonifacio St
Cotabato City, Philippines

Mr Robert Espinosa
Planning Officer
BFAR Region VI
Molo, Iloilo City, Philippines

Ms Luzviminda Muego
Provincial Population Officer
Province of Pangasinan
2401 Lingayen, Pangasinan, Philippines

Ms Jessica Muñoz
Assistant Project Director
Fisheries Resource Mgt Project, BFAR
2nd Floor Estuar Bldg
880 Quezon Avenue
Quezon City, Philippines

Dr Filipina Sotto
Department of Biology
University of San Carlos
P. del Rosario St
Cebu City, Philippines

Ms Elymi Ar-j Subang
Aquaculturist IFPED–BFAR
2nd Floor Estuar Bldg
880 Quezon Avenue
Quezon City, Philippines

Mr Alexander Valenciano
Chief, Economic Devt Division
NEDA Region VI
Fort San Pedro, Iloilo City, Philippines
Ms Lolita Villareal  
FAO Consultant  
Unit 3-3 VL Condominium  
Syquia corner Calderon Sts  
1009 Sta. Ana, Manila, Philippines

Ms Liberty Napilan  
University Research Associate  
Institute of Fisheries Policy and Development Studies  
College of Fisheries and Ocean Sciences  
UP in the Visayas  
5023 Miag-ao, Iloilo, Philippines

Dr Riza Aguilar  
Associate Professor  
Institute of Aquaculture  
College of Fisheries and Ocean Sciences  
UP in the Visayas  
5023 Miag-ao, Iloilo, Philippines

Dr Ninfa Pelea  
Dean  
Tabaco Campus  
Bicol University  
Tabaco, Albay, Philippines

Dr Evelyn Belleza  
Dean  
College of Management  
UP in the Visayas  
5000 Iloilo City, Philippines

Mr Jerome Cabansag  
UP in the Visayas Tacloban College  
6500 Tacloban City, Philippines

Mr Michael Garcia  
Instructor  
Division of Social Sciences  
College of Arts and Sciences  
UP in the Visayas  
5023 Miag-ao, Iloilo, Philippines

Mr Allan Moscoso  
University Researcher  
School of Technology  
UP in the Visayas  
5023 Miag-ao, Iloilo, Philippines

Prof. Caridad Jimenez  
Assistant Professor  
Institute of Fisheries Policy and Development Studies  
College of Fisheries and Ocean Sciences  
UP in the Visayas  
5023 Miag-ao, Iloilo, Philippines

Ms Genna Serofia  
University Extension Specialist  
Institute of Fisheries Policy and Development Studies  
College of Fisheries and Ocean Sciences  
UP in the Visayas  
5023 Miag-ao, Iloilo, Philippines

Dr Crispino Saclauso  
Director, Institute of Aquaculture  
College of Fisheries and Ocean Sciences  
UP in the Visayas  
5023 Miag-ao, Iloilo, Philippines

Dr Leonor Santos  
Director  
Institute of Fisheries Policy and Development Studies  
College of Fisheries and Ocean Sciences  
UP in the Visayas  
5023 Miag-ao, Iloilo, Philippines

Ms Liberty Napilan  
University Research Associate  
Institute of Fisheries Policy and Development Studies  
College of Fisheries and Ocean Sciences  
UP in the Visayas  
5023 Miag-ao, Iloilo, Philippines

Dr Enrico Villoso  
Director  
Institute of Marine Fisheries and Oceanology  
College of Fisheries and Ocean Sciences  
UP in the Visayas  
5023 Miag-ao, Iloilo, Philippines
Annex 3

Selected papers presented

at the Regional Workshop on the Use of Demographic Data in Fisheries and Coastal Development and Management in the Philippines and other Southeast and South Asian Countries

Iloilo, Philippines, 18–21 March 2002
Present and future role of the College of Fisheries and Ocean Sciences in fisheries and coastal resource management

by Glenn D. Aguilar

ABSTRACT

The College of Fisheries and Ocean Sciences finds itself having the unique role of trying to fulfill its mandate as the premier fisheries education institution in the country while being tasked to develop solutions to concerns urgently needing attention in fisheries and coastal resource management. Problems and issues are well defined through efforts dating back decades, but long-term sustainable solutions remain elusive. The current situation of Philippine fisheries and critical habitats as well as the situation of coastal resource management is described. Operations and nature of the College of Fisheries and Ocean Sciences, including expertise and research activities, are then presented and an effort made to match plans of the College with the perceived challenges.

Keywords: College of Fisheries and Ocean Science, fisheries and coastal resource management, fisheries educational institutions.

1. INTRODUCTION

Recent laws and integrated efforts notwithstanding, a dichotomy between fisheries and coastal resource management can be perceived in the available literature. While dichotomy in the literature may be attributed to the background of the researchers, concrete examples of dichotomy abound in the many significant projects implemented and funded on a large scale. To name the highest cost efforts, there exists the Fisheries Resource Management Project (FRMP) and the Coastal Resource Management Programme (CRMP), the Fisheries Sector Programme (FSP) and the Coastal Environment Programme (CEP). Structurally, within the government there are two different departments concerned – the Department of Agriculture with a mandate to produce sufficient food as well as promote production for revenue, and the Department of the Environment and Natural Resources with its mandated role of stewardship of the environment. This dichotomy reflects a regime that is in the process of finding an effective and constructive relationship between the need to produce food and generate revenue with the need to conserve and protect the environment. According to the Philippine coastal management guidebook series no. 1: Coastal management orientation and overview19, “Fisheries and their habitats cannot be managed separately.”

As the country’s premier academic institution in fisheries, the College of Fisheries and Ocean Sciences faces the challenge of gearing the different aspects of fisheries science to fully complement the efforts to institute sustainable and rational use of the

19 DENR et al., 2001.
nation’s coastal areas. The College has initiated efforts to this end by offering two new graduate programmes – the Master of Marine Affairs (MMA) and the Master of Science in Ocean Sciences (MSOS). The MMA caters to LGUs and government agencies involved in coastal resource management and has as its objective the formation of a pool of capable resource managers. The MSOS, on the other hand, offers majors in Biological Oceanography and Ocean Management and seeks to develop serious researchers required for the many difficult problems the sector faces. The College serves not only as a producer of graduates for industry, civil society and government nor as an institution for developing efficient production technologies: Through its research and extension activities, the College also serves as a convenient reference point and resource for the urgently needed efforts to institute complementation frameworks between fisheries science and coastal resource management. This role is already well established in the research of faculty who are involved in both fisheries management and coastal resource management projects in increasingly integrated modes.

This paper is an attempt to define the role required of the College of Fisheries and Ocean Sciences as an important proponent of national development, by first covering some well defined conditions of the fisheries and coastal resource management domain, then examining the present status of the College and trying to forecast its basic and extended roles within the next decade. It is not a definitive plan nor strategy for the College, it is rather an analysis of the services, opportunities and general direction required by the Filipino people of an institution that so much is expected of.

2. FISHERIES AND COASTAL RESOURCE MANAGEMENT IN THE PHILIPPINES

2.1 Fish production and balance of trade

Similar to the world trend, Philippine fish production increased dramatically from 1950 until the 1960s, grew positively in the 1970s and 1980s, and levelled off in the 1990s. Fish production dropped noticeably in the early 1980s, when high fuel costs coupled with overfished stocks resulted in declining production for almost a quarter of a decade. In the 1990s, with depletion of stocks, overfishing of nearshore areas and degradation of critical habitats resulting from increased exploitation rates, pollution and destructive human practices, declining rates of production increase were evident. Aquaculture, particularly seaweed culture, has been growing steadily since the late 1970s and in percentage terms contributes nearly a third to total fish production.

From 1991 until 2000, the average annual growth of municipal fisheries was –2.06 percent while commercial fisheries growth was +2.50 percent. The decline of municipal fisheries is indicative of the depletion of resources in the coastal areas where most fishing activities take place, while the increase in production of the commercial sector may be attributed to the expansion of fishing activities to waters farther offshore. Total fish production averaged an annual growth of +1.11 percent for the period, with aquaculture growing at an average annual rate of +3.99 percent.
The most productive fishing ground was the Western Palawan Waters with 18 percent of the average production recorded for the period 1992 to 1996. The Visayan Sea, South Sulu Sea and Moro Gulf were the next most productive fishing grounds. The relative percentage of commercial and municipal fisheries production is shown in Figure 2.

2.2 Domestic demand

Domestic consumption of fish products depends on population and per capita consumption. To estimate the domestic demand for fish as food, the population was multiplied by the per capita consumption of 36 kg/capita/year as determined by the Fourth Nutrition Survey of DOST. The FAO per capita consumption figure of 31 kg/capita/year was also used. To calculate the amount of fish and fishery products available for consumption, fishmeal and seaweed production were deducted from the total production figure. Results are shown in Figure 3. The consumption series (31 kg per caput and 36 kg per caput) reflect a growing population. Production has not been keeping pace with the needs of the population and a deficit in fish for food is evident since 1993 for the 36 kg per caput series, and since 1996 for the 31 kg per caput series. If this trend continues, a deficit of around 600 000 metric tonnes of fish supply for food is to be expected within the next two years. While this method of estimating domestic fish demand is not perfect, it is used in the development planning process being undertaken by NEDA to set targets for sectors of government.

2.3 Fisheries contribution to the Philippine economy

In 2000 and 2001, fisheries contributed P35 760 million and P37 758 million respectively, representing 18.7 percent and 19.1 percent of the total agriculture sector Gross Value Added at constant prices. This translates to 3.7 percent and 3.8 percent of the Gross Domestic Product. The growth of 5.6 percent from 2000 to 2001 is attributed to the increased output from aquaculture towards the end of the fourth quarter of 2001. Some slight increase in the contributions of the commercial and municipal fisheries was also noted.

<table>
<thead>
<tr>
<th>TABLE 1</th>
<th>Balance of trade 1990–2000 (in thousand US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year</td>
<td>Export</td>
</tr>
<tr>
<td>1990</td>
<td>395 960</td>
</tr>
<tr>
<td>1991</td>
<td>467 730</td>
</tr>
<tr>
<td>1992</td>
<td>393 993</td>
</tr>
<tr>
<td>1993</td>
<td>478 086</td>
</tr>
<tr>
<td>1994</td>
<td>533 087</td>
</tr>
<tr>
<td>1995</td>
<td>502 201</td>
</tr>
<tr>
<td>1996</td>
<td>436 542</td>
</tr>
<tr>
<td>1997</td>
<td>435 262</td>
</tr>
<tr>
<td>1998</td>
<td>479 710</td>
</tr>
<tr>
<td>1999</td>
<td>418 944</td>
</tr>
<tr>
<td>2000</td>
<td>506 902</td>
</tr>
<tr>
<td>Average</td>
<td>484 142</td>
</tr>
</tbody>
</table>

22 NSCB, 2002
a jump of almost 261 percent. Octopus and cuttlefish/squid are the next significant trade commodities. (Figure 4)

As of January 2002, 1.136 million Filipinos representing 3.8 percent of the labour force were directly employed by the fisheries sector.

### 2.4 Coastal resource management concerns

Many different terms related to coastal resource management are found in the literature. Terms such as coastal resource management, integrated coastal management, community-based coastal resource management, coastal zone management and co-management are sometimes used interchangeably. Throughout this text, the term coastal resource
management is used to refer to “the participatory process of planning, implementing, and monitoring sustainable use of coastal resources through collective action and sound decision making.” A majority of the country’s municipalities are coastal (832 out of 1,541), most major cities developed as seaports and 62 percent of Filipinos reside in the coastal areas of the country. Human activities combined with the demands of an increasing population threaten the different ecological systems of the coastal zone, including crucial habitats and the very resources that provide food and livelihood. The proximity of human populations to the coastal areas invariably result in resource use conflicts such as siltation from deforestation, commercial and municipal fisheries territorial disputes and development of extractive as well as processing industries with significant pollution potential. With the devolution of decision making to the LGU, inadequate policies and regulations are usually the norm.

Consider that of the country’s 27,000 square kilometres of coral reefs, only about 5 percent are in excellent condition: Mangrove forests have been reduced from 450,000 hectares in the 1920s to around only 120,000 hectares today, and within the last twenty years 50 percent of seagrass beds have been damaged.

Damage to habitats coupled with an increasing population growth of almost 2.3 percent translates to lower catch for fisheries. For example, in Cebu an estimated catch of 20 kg per fisher per day in the 1950s and 1960s has dwindled to an average of around 2 kg per fisher per day in 1998 (Figure 5). This also contributes to the widespread poverty in coastal areas where our fishers are among the country’s poorest.

Another concern is the illegal activities that some LGUs cannot eradicate nor even prevent. Blast fishing, use of toxic substances, harvesting of endangered species, conversion of mangroves and other such activities still occur and, given that laws exist to cover such occurrences, point to a lack of enforcement.

The open access regime existing in the country has been universally accepted as one of the major reasons for the depletion of resources and the degradation of the environment. Other issues include pollution, biodiversity conservation, policy and institutional gaps and conflicts.

Policy matters are quite important because the national agencies set up to manage fisheries (DA–BFAR) and the environment (DENR) often find areas of overlap, particularly where their respective jurisdiction is not clear and a systematic approach to management has not been established. At the local level, LGUs are mandated to implement the law but, more often than not, they have inadequate expertise, budget and even understanding on the most critical aspects of fisheries and coastal resource management.

3. THE UP VISAYAS COLLEGE OF FISHERIES AND OCEAN SCIENCES

Under the institutionalized National Agriculture and Fisheries Education System (mandated by the Agriculture and Fisheries Modernization Act of 1997), a network of centres of excellence in fisheries education has been determined. The Commission on Higher Education has recognized the College of Fisheries and Ocean

---

Sciences as a Centre of Excellence in Fisheries Education and also awarded the Institute of Marine Fisheries and Oceanology (as co-implementor together with the Division of Biological Sciences at the College of Arts and Sciences) as a Centre of Development in Marine Science.

Faculty of the College of Fisheries and Ocean Sciences consists of 22 Ph.D., 14 Master and 2 Bachelor degree holders. All Ph.D. holders of the faculty acquired their degrees from universities abroad (Japan–6, USA–8, UK–6, Germany–1, Australia–1). Specializations include aquaculture, aquaculture engineering, aquaculture management, aquatic biosciences, development communication, engineering education, feeds and feeding, fish biology, fish chemistry, fish diseases, fish handling and quality control, fish nutrition, fishing science, fishpond soils, food engineering, hatchery management, hydrobiology, marine benthos, marine fisheries, naval architecture and ocean engineering, ocean engineering, oceanography, pond natural productivity, pond nutrients, quality control, statistics, thermal processing of fish, water quality and zooplankton ecology.

In relation to other programmes nationally, there are a total of 49 institutions offering diploma or undergraduate programmes in fisheries and ten institutions offering graduate degrees in fisheries, marine biology and coastal resource management related fields (Figure 6). These include programmes in ocean sciences, marine affairs or management, coastal resource management and marine biodiversity.
3.1 Instruction
The College of Fisheries and Ocean Sciences of the University of the Philippines in the Visayas started as the Philippine Institute of Fisheries Technology. It was absorbed by the University of the Philippines and transformed into the College of Fisheries to offer undergraduate and graduate degrees in Fisheries. In recognition of the work it had been doing in the aquatic environment, in 1999 it was renamed the College of Fisheries and Ocean Sciences to attract students and to signify the importance of the environment and the direction of the college in its instruction, research and extension functions.

The College moved from UP Diliman to a new campus at Miag-ao, Iloilo in 1988. This campus was built through the Sixth Education Project of the World Bank that also included the construction of seven Regional Institutes of Fisheries Technology (RIFTs). The RIFTs have since then evolved into or been absorbed by the different State Universities and Colleges (SUCs). The World Bank project also had a substantial human resources development programme through which many of the current faculty of CFOS pursued scholarships abroad. Currently, the College consists of four institutes that develop and teach their respective courses, with each institute having its own research centres and laboratories:

- **Institute of Marine Fisheries and Oceanology**
  - M.S. Fisheries (Fish Biology)
  - M.S. Ocean Sciences

- **Institute of Aquaculture**
  - Ph.D. in Fisheries (Aquaculture)
  - M.S. Fisheries (Aquaculture)
  - Master of Aquaculture
  - B.S. Aquaculture

- **Institute of Fisheries Policy and Developmental Studies**
  - Master in Marine Affairs
  - B.S. Fisheries (Fisheries Business Management)

- **Institute of Fish Processing Technology**
  - M.S. Fisheries (Fish Processing Technology)
  - B.S. Fisheries (Fish Processing Technology)

Since 1948, the College produced more than 2,600 graduates. The number of graduates peaked in the 1980s when the Marcos Scholarship for Fisheries (now the BFAR Scholarship) was institutionalized. The highest number of graduates was in 1984 when 122 graduated. Enrolment dropped in the early 1990s because of the transfer of the College to Miag-ao. Since then, the number of graduates has fluctuated between 30 and 40 per year (Figure 7).

Two new programmes were instituted in 1999 – the Master of Science in Ocean Sciences (MSOS) and the Master in Marine Affairs (MMA). The MSOS is a traditional thesis-based course and was designed to develop research competencies in the basic ocean sciences, i.e. biological, physical, geological and chemical oceanography; ocean management; information systems for ocean sciences. The course is biased towards the basic research areas of the oceans.

![FIGURE 7](image)

Graduates of the CFOS
The Master of Marine Affairs Programme (MMAP) is a professional course offered in trimestral mode and can be completed in one year. Initiated with the support of the CIDA-funded Island Sustainability Livelihood and Equity (ISLE) programme, the course was developed by an interdisciplinary team with assistance from Dalhousie University. It is designed to primarily cater to the Local Government Units (LGUs) that have charge of municipal waters and to the government agencies that implement the national laws and different instruments of such laws. A quick look at the student composition (from school year 1999 to 2001) shows that most of the students enrolled are affiliated with the LGUs from the office of the Municipal Agricultural Officer (Table 2).

<table>
<thead>
<tr>
<th>Affiliation</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bureau of Fisheries and Aquatic Resources (BFAR)</td>
<td>13</td>
</tr>
<tr>
<td>Provincial Agriculture Office (PAO)</td>
<td>5</td>
</tr>
<tr>
<td>Schools</td>
<td>5</td>
</tr>
<tr>
<td>Philippine Coast Guard (PCG)</td>
<td>2</td>
</tr>
<tr>
<td>Department of Environment and Natural Resources (DENR)</td>
<td>1</td>
</tr>
<tr>
<td>City Planning Office</td>
<td>1</td>
</tr>
</tbody>
</table>

With the initial popularity of the MMAP programme, it is envisioned that a critical mass of well-trained resource managers will contribute to the proper management of the country’s coastal resources.

### 3.2 Research

Under the Agriculture and Fisheries Modernization Act, which focused attention on agriculture and fisheries research, the Bureau of Agriculture Research formed research, development and extension (RDE) networks consisting of institutions engaged in agriculture and fisheries research. Leadership of the National RDE Networks for Capture Fisheries and Aquaculture and of the Sub-Programme on Food Science for Fisheries Post Harvest was entrusted to the UPV College of Fisheries and Ocean Sciences. Network operations include proposal evaluations, research monitoring, evaluation workshops and having the National Integrated RDE agenda and programmes presented before a series of bodies before being approved by the cabinet-level Committee on Extension, Research and Development for Agriculture and Fisheries (CERDAF).

As most of the fisheries researchers are located in the College of Fisheries and Ocean Sciences, a sizeable percentage of direct research funds have been granted to UPV. A yearly Institutional Development Grant to establish critical laboratories has also been provided.

Other government agencies have also provided research support for research coordination activities, such as those carried out by the Visayas Zonal Centre of the Philippine Council for Aquatic and Marine Resources Development of the Department of Science and Technology. The Fisheries Resource Management Project tapped CFOS faculty to undertake the resource and social assessment research of Sapian Bay and Davao Gulf. There are many other projects undertaken by the faculty but the preceding are the biggest and most closely associated with the evolving integration of fisheries science into coastal resource management.

The College is also involved in international programmes such as the Japan Society for the Promotion of Science (JSPS), a ten-year programme that is already on its fourth year. UPV hosted last year’s International Conference of JSPS on Capture Fisheries, resulting in 44 papers to be published in the UPV Journal of Natural Sciences. Results of the conference will contribute to Philippine capture fisheries by introducing technologies that promote sustainable and responsible fishing techniques and approaches.

### 3.3 Extension

The third function of the university is extension. Within the CFOS, extension mainly takes the form of short-term programmes catering to a variety of clientele including government agencies, local government units, schools and the private sector. These short-term training programmes are very useful venues for transferring immediately useful technologies to the recipients. Individual faculty also participate in the UP Pahinungod programme as well as offer different consultancy services based on their expertise.

---

4. THE ROLE OF THE COLLEGE OF FISHERIES AND OCEAN SCIENCES

4.1 Continuation of its work

Given the many and complex challenges of fisheries and coastal resource management, the CFOS will contribute by doing what it does best – produce capable graduates, conduct responsive research and extend expertise to those who need them. Along the way, innovative programmes to address recurrent and urgent needs will have to be developed, either through the modification of existing programmes or the introduction of new ones (such as the MSOS and MMAP).

As a third level course, Fisheries is not attractive to graduating high school students. Perhaps the popularity of other high paying careers combined with the traditional image of smelly fish combine to make the course unpopular. With more responsive course offerings, the increasing involvement of NGOs and other groups in resource management and greater recognition of the need to solve coastal resource management problems, it is expected that additional options will exist for fishery graduates.

Through the establishment of research laboratories and an evolving network of scientists, more relevant research will naturally occur. In the implementation of the RDE network project under AFMA, for example, inputs from the industry, peer evaluators and recipients of the research results have been institutionalized into the proposal and implementation stages. One major task left is to translate research findings into different usable forms such that, for instance, policies for policy makers, technologies for fisherfolk and research material for scientists are processed rapidly and efficiently. Results of previous research have conveniently found their way into cabinets and libraries without any discernible impact or tangible contribution. This has to be addressed if research by the College if going to make its mark.

4.2 Providing expertise and leadership

A critical mass of expertise in fisheries and coastal resource management is not yet available. This is evidenced by the many instances of environmental problems that manifest themselves, such as fish kills and disease outbreaks. An expert available at the onset of a problem would know the mitigation required to lessen or minimize the effects of the problem. The shortage of experts is further compounded by distance and travel time required due to the archipelagic nature of the country. To this end, the CFOS must develop the faculty of other educational institutions. A scholarship programme implemented in the traditional and distance modes and which includes support for faculty substitutes in the schools may be the best approach. Also, incentives to graduates of the College to teach at these schools can complement the recruitment of their faculty.

Faculty of the College is routinely asked to handle leadership positions in the different agencies and projects on fisheries. For example, we have faculty with the Fisheries Resources Management Project and the World Wildlife Fund. This will continue until the critical mass defined in the previous paragraph is achieved.

4.3 Self-sustaining operations

Given the government plan to slash maintenance and operating expenses within the next three years, the University of the Philippines will have to generate resources on its own. This will filter down to the College. A sufficient level of support from external sources must be developed so the College can continue to offer relevant instruction and responsive research and extension. How this will impact on the need to provide services to communities with minimal income will have to be determined.

4.4 Basic research and development of appropriate technologies

There are still many questions regarding the scientific aspects of fisheries and coastal resources that must be answered. In aquaculture, the recurrence of fish diseases, the incidence of viral and bacterial infestations in prawn, the threats (or promise) of GMOs, better culture systems and alternative culture species are some research areas needing immediate attention. In capture fisheries, the status of fish stocks, sustainability of fishing operations, oceanography and basic fish biology need to be worked on for effective management of the resources. In fish processing, quality standards as required by the export market, value added products, quality control and handling are also important. Cross cutting topics such as information systems and knowledge delivery for fisheries and coastal resource management, biotechnology, policy studies, social assessment, review and analysis of legislation and other important topics need serious attention.

The establishment of research groups consisting of experts for each field is one way to create responsive research activities. Another is the
development of fully equipped laboratories with adequate equipment and proper maintenance. Publication to validate research results contributes to a healthy research environment and should be a requirement.

4.5 Improved delivery of research findings

Too often, research findings are not utilized and in their final form end up as terminal reports to funding agencies. This is not only a waste of money but also results in having the same research project conducted over and over again. Currently, some initiatives exist that will address this issue. One is the incentive mechanism for publication in scientific journals; the other is the requirement of funding agencies to provide ‘knowledge products’ from funded research. This may be in the form of information materials in different media including the Internet, or as packaged technologies that can immediately be implemented. For fisheries and coastal resource management, it gets a little bit more complicated because of the difficulty that a very specialized scientist has in translating his highly technical results and integrating it into the work of others before finally presenting the work in a form understandable to local managers of the resource. For such technologies to be effectively utilized, some support systems for translating or producing readily applicable and functional knowledge is necessary.

5. CONCLUSION

Given the complexity of the operating environment, the underdeveloped science of fisheries in the country and the fuzziness of the human players involved, the role of the College of Fisheries and Ocean Sciences is easy to define but difficult to implement. With the twin challenges posed by the need to ensure sustainable amounts of fish products for food coupled with the need to prevent environmental degradation, the CFOS must continue its mandate to provide quality education, perform responsive research and provide relevant extension services.

A perception of dichotomy in fisheries and coastal resource management was earlier mentioned, but the subsequent definition of problems and the definition of the functions and role of the CFOS presented a blurring and loss of distinction between the two. Also, the natural evolution of the programmes being offered and of the research activities being undertaken by the College is seen to address the many different aspects of the study areas. Hence from this viewpoint, fisheries and coastal resource management cannot be treated separately if effective research is to be obtained. The problem may lie with the dichotomy of jurisdiction of government agencies in these two areas. It may be timely to form a Department under which fisheries and coastal resource management can be truly integrated.
REFERENCES


Fisheries and coastal resource management in the Philippines

by Jessica C. Muñoz

Assistant Project Director
Fisheries Resource Management Project
Bureau of Fisheries and Aquatic Resources
Department of Agriculture

1. INTRODUCTION

The Philippine archipelago is composed of some 7100 islands and islets. The country’s territorial marine area is 220,000 km$^2$ with a shelf area of 18,460 km$^2$ within 200 meters depth. The country’s continental shelf covers 225,800 km$^2$ and its coastline is 17,460 kilometres long. The country offers a rich and diversified marine life.

The fisheries sector is an important component of the country’s efforts towards attaining food security. The Philippines is an important producer of fish. It has steadily figured among the 52 top fish producing countries in the world. In 2000, the Philippines produced 2.8 million metric tonnes of fish valued at P95.5 million. Of the total production, the aquaculture sector contributed 34.1 percent, the commercial fisheries sector 33.0 percent and the municipal fisheries sector 32.9 percent. The Philippines was the world’s second biggest producer of seaweeds, contributing 7.5 percent, or 0.643 million metric tonnes, to the world seaweed production of 9.6 million metric tonnes. The fisheries sector contributed P76.4 billion (2.3 percent) and P35.8 billion (3.7 percent) at current and constant prices respectively, to the country’s Gross Domestic Product (GDP) of P3,323 billion at current prices and P954 billion at constant prices.

The vast and diverse fishery resources provide food, livelihood and transport to an estimated population of 76 million Filipinos. Aside from fisheries’ contribution to food security, the fishing industry provides employment to about 5 percent of the country’s labour force. There are 74,537 individuals engaged in aquaculture, 374,408 municipal fishers and 357,984 commercial fishers.

About 70 percent of the 76 million Filipinos live along the coastal areas. The population growth rate is 2.6 percent. While the per capita fish requirement is 44 kg per capita per year, only 36 kg per capita per year is available for the total population.

2. STATUS OF COASTAL HABITATS AND FISHERIES RESOURCES

The extensive shallow seas of the Philippines have historically been rich in coastal resources – fish and shellfish and the habitats (coral reefs, seagrass beds, and mangroves) that nurture them. Unfortunately, these resources are severely being degraded throughout the country and are fast being depleted.

2.1 Coral reefs

Coral reef areas substantially contribute to fisheries productivity. A healthy coral reef can produce 20 metric tonnes of fish per square kilometre per year, enough fish to provide 50 kg of fish per year to 400 people. There are more than 70 genera and 400 species of hard corals documented, as well as about a thousand associated species. There are about 27,000 km$^2$ of coral reef area within the 10-fathom deep. However, less than 5 percent is considered in excellent condition and over 70 percent in poor to fair condition. Extensive coralline/hard bottoms are located in Palawan, Sulu, the Visayas and the central part of the country’s Pacific Coast. Coral cover data from various surveys of Philippine reefs indicate that only 5 percent are in excellent condition (more than 75 percent living coral...
2.2 Mangrove communities

Mangrove communities are sources of various products in the coastal ecosystem. About 51 species of mangroves have been identified in the Philippines. These yield by-products such as timber and other building materials, high grade charcoal, tannins, resins, dyes and medicines. Mangrove resources have diminished from 450,000 hectares at the beginning of the century to about 150,000 hectares today as a result of extensive fishpond development. In 1965, mangrove areas covered about 4,500 km². Ten years later only about 2,500 km² were left. Sixty percent of this decline was due to conversion of mangroves into aquaculture ponds for milkfish and prawns. By 1981, an aggregate cover of only 1,460 km² was intact.

2.3 Seagrass

With 16 seagrass species recorded, the Philippines is second only to Western Australia among the 27 countries of the Indo-Pacific region. Extensive seagrass beds have been identified in Bolinao, Palawan, Cuyo Island, Cebu, Bohol, Siquijor, Zamboanga and Davao. Seagrass communities in the country manifest signs of degradation due to the combined effects of natural calamities, predation, aquaculture, deforestation, siltation and destructive fishing methods.

2.4 Seaweeds

Like coral reef, mangrove and seagrass communities, seaweed beds play a vital role in the coastal environment. There are 190 species of seaweed recorded in the Philippines. About 150 species are considered economically important but only a few are cultivated. Of particular importance is *Eucheuma* spp. To date, the Philippines is the world’s second largest supplier of *Eucheuma*, producing about 7.5 percent of the total world supply of 8.6 million metric tonnes. There are about 80,000 seaweed farmers with 350,000 dependents that rely on the seaweed industry in the country.

2.5 Fisheries

The Philippine fisheries are subdivided into three categories: commercial fisheries, municipal fisheries and aquaculture. Commercial fisheries refer to capture fishing operations using vessels of more than 3 gross tonnes. Municipal fisheries refer to fishing operations using vessels with 3 gross tonnes or less. Aquaculture refers to fish culture activities in marine and inland waters. About 64 percent of total fish production comes from the capture fisheries. Commercial fishing vessels such as purse seine, trawl, ringnet and bagnet are able to go to deeper and farther areas in search of fish. Trawl catches are predominantly demersal while purse seine, ringnet and bagnet catches are primarily big and small pelagics. Commercial fishing of pelagics is often associated with the use of “payao” or fish-aggregating device. “Payao” is efficient and effective in attracting tuna and tuna-like fishes. There are over 100,000 units of “payao” in the country. Small pelagics usually dominate the landings of the commercial fisheries sector.

The municipal fisheries sector is carried out in nearshore waters. Gears used are simple and boats may be motorized or non-motorized. Gill net, hook and line, baby trawl and stationary gears are the commonly used gears. Similar to the commercial fisheries sector, small pelagics compose most of the landings of municipal fisheries.

After World War II, marine municipal and commercial fisheries landings have been recorded since 1946. Production grew by small increments from 1946 to 1985, with a marked increase in growth increments observed between 1960 and 1970. By 1992, there was overfishing of the traditional fishing grounds in the country. Biological and economic overfishing has resulted from the high level of fishing effort.

3. SOCIO-ECONOMIC CONDITIONS AND DEMOGRAPHICS

The marine and coastal zones are very important to the Philippines. About 63 percent of the country’s provinces as well as two-thirds of its municipalities are located in the coastal zones. Furthermore, over 64 percent of its 76 million population reside in some 10,000 coastal barangays, including major urban centres. The coastal zone serves as the base for human settlement, and accommodates a number of major industrial, commercial, social, and recreational activities. Because of their inherent wealth and opportunities, coastal areas have high population densities. Increasingly, people are driven by subsistence and survival and thus engage in unregulated activities therein. The unabated increases in urbanization, industrialization, and population have severely affected the state of Philippine coastal and marine resources. Consequently, the constant and
heavy exposure to numerous pressures – both artificial and natural, has taken its toll on the ecosystems. Pollution is likewise a major problem where several sources have contaminated marine and coastal waters.

The increasing population has greatly contributed to the depletion of resources especially in the coastal zones. The intensification of fishing activities within the 15-kilometer area from the coast has reduced fishing activities to a hand-to-mouth existence among municipal fisherfolk. About 80 percent of the coastal fisherfolk live below the poverty line (US$283 or P14 000). Overpopulation in most coastal barangays exacerbates the poverty in the area.

Municipal fishers are considered the “poorest of the poor”. They are usually described as a non-bankable group in the coastal community. Most municipal fishers have low educational attainment. They lack the skills and knowledge to undertake other livelihood options. The majority do not own land and do not possess valuable properties. There may be a small number of part-time fisherfolk who are engaged in farming. However, these fisherfolk are only tenants. Some fisherfolk are also engaged in part-time trading and home-based industries.

4. FISHERIES AND COASTAL MANAGEMENT POLICIES: THE LEGAL FRAMEWORK

In line with the country’s commitment to sustainable development, the Philippine Council for Sustainable Development (PCSD) was created in 1992 to chart the environment and sustainable development of the country. Foremost among the steps taken to pursue this commitment is the formulation of Philippine Agenda 21 (PA 21). Philippine Agenda 21 envisions a better quality of life among Filipinos through the development of a just, moral, creative, spiritual, economically vibrant, caring, diverse yet cohesive society characterized by appropriate productivity, participatory and democratic processes, and living in harmony within the limits of the carrying capacity of nature and the integrity of creation. PA 21 represents the country’s will to pursue a development approach taking into consideration the following principles: (1) primacy of developing human potential; (2) holistic science and appropriate technology; (3) self-determination; (4) cultural, moral and spiritual sensitivity; (5) national sovereignty; (6) gender sensitivity; (7) peace, order and unity; (8) social justice, inter- and intra-generational and spatial equity; and (9) participatory democracy.

The national policy and legal framework for coastal management is composed of national laws, administrative issuances, and international treaties and agreements that define or guide management responsibilities for and uses of coastal resources. As a basic service of local government, coastal management incorporates all the local government powers and responsibilities, which include planning, protection, legislation, regulation, revenue generation, enforcement, intergovernmental relations, relations with people and NGOs, and extension and technological assistance.

At the apex of the hierarchy of laws governing fisheries and coastal management is the 1987 Constitution. The following sections of the Constitution provide general guidance for the management and use of all natural resources in the Philippines:

- Article II, Sections 15 and 16: The State shall protect and promote the right to health of the people; the State shall protect and advance the right of the people to a balanced and healthful ecology in accord with the rhythm and harmony of nature.
- Article XII, Section 2: The exploration, development, and utilization of natural resources shall be under the full control and supervision of the State. The State shall protect the nation’s marine wealth, ... and exclusive economic zone, and reserve its use and enjoyment exclusively to Filipino citizens.
- Article XIII, Section 7: The State shall protect the rights of subsistence fishers, especially of local communities, to the preferential use of the communal marine and fishing resources, both inland and offshore. It shall provide support to such fishers through appropriate technology and research and other services.
- Article XIII: The right of the people and their organizations to effective and reasonable participation at all levels or social, political, and economic decision-making shall not be abridged.

4.1 The Local Government Code of 1991 (RA 7160)

Coastal resources are important assets that should be managed properly by local government units (LGUs) and their communities. Thus, the Local Government Code of 1991 (LGC), or Republic Act 7160, was enacted and implemented all over the country. The Local Government Code is one of the most radical and innovative legislations passed in the Philippines. The Code decentralized a considerable number of functions and responsibilities to the local government units (municipal and provincial). The Code puts the local government units at the forefront of fisheries management within the 15 kilometre-limit of the
coastal waters. Local government units implement laws for the majority of activities that influence the terrestrial and coastal marine zones. Under the Local Government Code, legislative powers are exercised through their respective local legislative councils.

The execution of the LGC is an event of major significance in local governance in the Philippines. It has tremendously enhanced the governmental and corporate powers of LGUs specifically in two important aspects: political autonomy and decentralization, and resource generation and mobilization. In accordance with the 1987 Constitution (Article II, Section 25; Article X, Sections 1, 2, and 15), LGUs now enjoy a greater measure of autonomy and self-governance. The intent of Congress was for LGUs to possess genuine and meaningful local autonomy to accelerate their fullest development as self-reliant communities and make them more effective partners in the attainment of national goals. Autonomy refers to the power of LGUs to enjoy limited self-government as defined by law. The Constitution declares that local autonomy means a “more responsive and accountable local government structure instituted through a system of decentralization.” Autonomy, however, is not meant to end the partnership and interdependence between the central government and LGUs; otherwise it might usher in a regime of federalism, which is not the intention of the Constitution. LGUs are subject to regulation, however limited, to enhance self-governance.

The LGC likewise emphasizes the role of LGUs with regard to sharing responsibility with the national government for the management and maintenance of ecological balance within their respective jurisdictions. After all, among government units, it is the LGU that is closest to the people and has the authority to shape and reshape policies on resource utilization. The pertinent provisions of the Local Government Code relate to the following:

- enhancement of the right of the people to a balanced ecology;
- provision of extension and on-site research services and facilities related to agriculture and fishery activities;
- provision of a solid waste disposal system or environmental management system and services and facilities related to general hygiene and sanitation;
- enforcement of forestry laws limited to community-based projects, pollution control laws, small mining laws and other laws on the protection of the environment;
- enactment and enforcement of necessary fishery ordinances and other regulatory measures in coordination with non-governmental organizations and people’s organizations in the community;
- forging of joint ventures to facilitate the delivery of certain basic services, capability building and livelihood development.

All ordinances enacted and passed by the local government units must be in accordance with the national fishery and environmental laws.

4.2 The Fisheries Code of 1998 (RA 8550)

The Fisheries Code is an act providing for the development, management and conservation of the fisheries and aquatic resources of the country. This Code is a consolidation of prior fishery laws and an update of prior laws related to fisheries. Some provisions are quite new and innovative, while others reiterate or improve old ones. The Fisheries Code includes new prohibitions against electrofishing, blast and cyanide fishing, use of fine mesh nets, gathering of corals and use of super lights. It establishes coastal resource management as the approach for managing coastal and marine resources. The following policies are embodied in the Code:

- Achieve food security as the overriding consideration in the utilization, management, development, conservation and protection of fisheries resources to provide the food needs of the population. A flexible policy towards the attainment of food security shall be adopted in response to changes in demographic trends of fish consumption, emerging trends in the trade of fish and other aquatic products in domestic and international markets, and the law of supply and demand.
- Limit access to the fishery and aquatic resources of the Philippines for the exclusive use and enjoyment of Filipino citizens.
- Ensure the rational and sustainable development, management and conservation of fishery and aquatic resources in Philippine waters including the Exclusive Economic Zone (EEZ) and in the adjacent high seas, consistent with the primordial objective of maintaining a sound ecological balance and protecting and enhancing the quality of the environment.

---

28 Article X, Section 1, 1987 Constitution.
Protect rights of fisherfolk, especially of the local communities, and give priority to municipal fisherfolk in the preferential use of municipal waters. Such preferential use shall be based on, but not limited to, Maximum Sustainable Yield (MSY) or Total Allowable Catch (TAC) on the basis of resource and ecological conditions, and shall be consistent with the Philippines’ commitments under international treaties and agreements.

Provide support to the fishery sector, primarily to municipal fisherfolk including the women and youth sectors, through appropriate technology and research, adequate finance, production assistance, construction of post-harvest facilities, marketing assistance and other services. The protection of municipal fisherfolk against foreign intrusion shall extend to offshore fishing grounds. Fishworkers shall receive a just share for their labour in the utilization of marine and fishery resources.

Manage fishery and aquatic resources in a manner consistent with the concept of integrated coastal area management in specific natural fishery management areas, appropriately supported by research, technical services and guidance provided by the State.

Grant private sector the privilege to utilize fishery resources under the basic concept that the grantee, licensee or permittee thereof shall not only be a privileged beneficiary of the State but also an active participant and partner of the Government in the sustainable development, management, conservation and protection of the fishery and aquatic resources of the country.

With these policies, the State ensures the attainment of (a) the conservation, protection and sustained management of the country’s fishery and aquatic resources; (b) poverty alleviation and the provision of supplementary livelihood among municipal fisherfolk; (c) the improvement of productivity of aquaculture within ecological limits; (d) the optimal utilization of offshore and deep-sea resources; and (e) the upgrading of post-harvest technology. Some provisions of the Fisheries Code relate to the following:

- enactment of appropriate fishery ordinances in accordance with the national fisheries policy;
- enforcement of all fishery laws, rules and regulations as well as valid fishery ordinances enacted by the municipal council;
- integration of the management of contiguous fishery resources/areas, which must be treated as a single resource system;
- granting of fishing privileges to duly registered fisherfolk organizations/cooperatives;
- ensuring that municipal waters are utilized by municipal fisherfolk or organizations/cooperatives, except when an appropriate fishery ordinance is enacted to allow commercial fishing within the municipal waters in accordance with Section 18 of the Code;
- maintenance of a registry of municipal fisherfolk for monitoring fishing activities and for other related purposes;
- issuance of permits to municipal fisherfolk and organizations/cooperatives that will be engaged in fish farming and/or seaweed farming;
- granting of demarcated fishery rights to fishery organizations/cooperatives for mariculture operation; and
- provision of support to municipal fisherfolk through appropriate technology research, credit, production and marketing assistance and other services.

Recognizing the need to involve the local government units as well as the coastal communities in the management of coastal resources, the Fisheries Code supports the creation of Fisheries and Aquatic Resource Management Councils (FARMs) at the national, regional and local levels. The three levels of the management councils are the National Fisheries and Aquatic Resource Management Council (NFARM), the Municipality/City Fisheries and Aquatic Resource Management Council (MFARM/CFARM), and the Integrated Fisheries and Aquatic Resource Management Council (IFARM).

4.3 The Agriculture and Fishery Modernization Act of 1997 (AFMA, RA 8435)

The foremost goals of the Agriculture and Fisheries Modernization Act are a more equitable distribution of opportunities, income and wealth in the national economy; a sustained increase in the amount of goods and services produced by the nation for the benefit of the people; and expanding...
productivity as the key to raising the quality of life for all, especially the underprivileged.

The AFMA adheres to the following principles: (1) poverty alleviation and social equity; (2) food security; (3) rational use of resources; (4) global competitiveness; (5) sustainable development; (6) people empowerment; and (7) protection from unfair competition. The objectives of the AFMA are:

- to modernize the agriculture and fisheries sectors by transforming these sectors from a resource-based to a technology-based industry;
- to enhance profits and incomes in the agriculture and fisheries sectors, particularly among small farmers and fisherfolk, by ensuring equitable access to assets, resources and services and promoting higher value crops, value-added processing, agribusiness activities and agro-industrialization;
- to ensure the accessibility, availability and stable supply of food to all at all times;
- to encourage horizontal and vertical integration, consolidation and expansion of agriculture and fisheries activities, groups, functions and other services through the organization of cooperatives, farmers’ and fisherfolk’s associations, corporations, nucleus estates, and consolidated farms and to enable these entities to benefit from economies of scale, afford a stronger negotiating position, pursue more focused, efficient and appropriate research and development efforts, and hire professional managers;
- to promote people empowerment by strengthening people’s organizations, cooperatives and NGOs and by establishing and improving mechanisms and processes for their participation in government decision-making and implementation;
- to pursue a market-driven approach to enhance the comparative advantage of our agriculture and fisheries sectors in the world market;
- to induce the agriculture and fisheries sectors to ascend the value-added ladder continuously by subjecting their traditional or new products to further processing in order to minimize the marketing of raw, unfinished or unprocessed products;
- to adopt policies that will promote industry dispersal and rural industrialization by providing incentives to local and foreign investors to establish industries that have linkages to the country’s agriculture and fisheries resource base;
- to provide social and economic adjustment measures that increase productivity and improve market efficiency while ensuring the protection and preservation of the environment and equity for small farmers and fisherfolk; and
- to improve the quality of life of all sectors.

These policies recognize the importance of fisheries for food security and underscore AFMA’s goals for a sustained increase in production in the agricultural and fisheries sectors. AFMA seeks to increase the volume, quality, and value of fisheries production for domestic consumption and export through modernization, increased reliance on advanced technology and a market-based approach while giving due attention to the principles of sustainable development.

4.4 International treaties

The Philippine Government has affirmed its commitment to support global efforts to protect the environment by participating in the formulation and signing of several international treaties on various aspects of environmental management. Among these treaties relevant to coastal resource management are the following:

- International Convention for the Prevention of Pollution of the Sea by Oil – 1964
- International Convention for the Prevention of Pollution from Ships – 1973
- Montreal Protocol on Substances that Deplete the Ozone Layer – 1991

In addition, and perhaps more importantly, the Philippines is signatory to global programmes of actions that are not strictly treaties but are nonetheless significant in the area of environmental management. These global programmes of action include:

- Chapter 17 of Agenda 21: Protection of the Oceans, All Kinds of Seas, Including Enclosed and Semi-enclosed Seas, and Coastal Areas and

- Global Programme of Action for the Protection of the Marine Environment from Land-based Activities, from the United Nations Environment Programme (UNEP, 1995)

These treaties have significant implications for resource management programmes at the local level. The ratification of the UNCLOS has formally established the Philippine 200-mile Exclusive Economic Zone and substantially enlarged the country’s maritime jurisdiction. However, under the UNCLOS, the Philippines also committed to protect and preserve the marine environment through the adoption of appropriate measures, rules and regulations.

4.5 Multilateral agreements

4.5.1 Multilateral High Level Conference (MHLC)

At present, one of the most important agreements the Philippines has entered into is the Agreement to implement the provisions of the Convention for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean. This Agreement under the MHLC aims to ensure, through effective management, the long-term conservation and sustainable use of highly migratory fish stocks in the western and central Pacific Ocean in accordance with the 1982 United Nations Convention on the Law of the Sea and the Agreement. Member countries/states are Tuvalu, Kiribati, Nauru, Niue, Tonga, Fiji, Solomon Islands, Samoa, Cook Islands, Marshall Islands, Federated States of Micronesia, Papua New Guinea, Palau, New Zealand, USA, Indonesia, Vanuatu, New Caledonia, Philippines, Australia, People’s Republic of China, Republic of Korea, French Polynesia and Japan.

4.5.2 Code of Conduct for Responsible Fisheries (CCRF)

The Philippines is an active participant in the Regionalisation of the Code of Conduct for Responsible Fisheries Project initiated by the Southeast Asian Fisheries Development Center (SEAFDEC). For the past three years, the Philippines has been a member of the working group that is drafting guidelines so that the provisions of the CCRF will be implemented at the regional (Asian) level. Members of the working group are Brunei Darussalam, Indonesia, Japan, Malaysia, Philippines, Singapore, Thailand and Viet Nam.

5. FISHERIES AND COASTAL MANAGEMENT INTERVENTIONS AND STRATEGIES

A shift in government policies on fisheries was observed about a decade ago. This shift started as an effort to manage the coastal resources in general, and fisheries resources in particular. Although NGOs, POs, local government units and the academe had initiated projects and activities, it was the first time that the government, especially the Bureau of Fisheries and Aquatic Resources (BFAR), took a closer look at the status of fisheries throughout the country. Coastal resource management (CRM) was viewed as an approach to address the problems faced by the marine resources. There was also the acceptance and adherence to the concept of community-based resource management (CBRM) – specifically, to enable coastal communities to participate actively in the management of the entire resource system. In order to implement effective fisheries management, the provisions of the Fisheries Code and Local Government Code should be instituted. These codes can only be successfully implemented if committed, knowledgeable, and technically skilled local practitioners work hand in hand to manage the coastal resources and develop the supporting policy and legal framework. Without the latter, even advocates of coastal resource management will find themselves handicapped and without adequate authority to collect revenues, to prohibit fishing in sensitive areas, to limit access to municipal waters, to adopt economic incentives or certification programmes to encourage users to act in ecologically intelligent ways or to impose sanctions on those who violate management plans.

A considerable amount of legislation has been passed, many regulatory mechanisms have been utilized, institutions have been reformed and new ones have been created. However, these current arrangements do not adequately deal with the mounting problems in the marine and coastal zones. Therefore, the use of one or a combination of other strategies that would move away from command and control approaches in favour of community-based and market-based approaches needs to be explored.

5.1 Coastal and Fisheries Management Programmes

This section briefly describes the major coastal and fisheries management programmes/projects that have been implemented by various government agencies, local and international
NGOs, POs, the academe and local government units. These projects only focused on the specific component of CRM and were not integrated with other components of resource management. Most of the projects were foreign-assisted, with a time frame of five to six years.

5.1.1 Central Visayas Regional Project (CVRP) – 1984 to 1990
The CVRP was implemented to establish approaches to natural resource management based on community participation, extending/adopting project technologies, improving natural resource management and increasing participant incomes. The project introduced innovative measures such as the watershed-based approach (upland to nearshore fisheries and coral reef) and community organization as the basis for natural resource management. It made an effort to provide security of tenure for resource users. The project promoted the rehabilitation of coastal resources through the establishment of fish/marine sanctuaries, deployment of artificial reefs, mangrove forestation and restriction of fisheries exploitation.

High financial and economic returns were reported for the households in the project area. There were also high rates of technology adoption. The project was able to develop a cadre of trained local personnel on community-based natural resource management. Composite law enforcement teams (CLET) were formed to assist in the implementation of rehabilitation efforts. There was active collaboration among the agencies involved in the project.

While there was a need for external staff/consultants during the project life, to assure project sustainability it was recognized that local government units (LGUs) and NGOs had to be involved in the implementation of the CVRP and that the capabilities of the LGUs had to be strengthened. Difficulty of operation was encountered due to the lack of a legally authorized framework for common property agreement. The need to monitor and document processes was also underscored.

The CVRP experience established that fishing communities could be effective managers of coastal resources when given the opportunity. It was observed that habitat improvement implemented by the coastal community could increase fishery resources and fisher incomes and, furthermore, that stakeholder control over the resources would result in better utilization of such resources.

5.1.2 Fisheries Sector Programme (FSP) – 1990 to 1995
The Fisheries Sector Programme (FSP), implemented by the Department of Agriculture through the Bureau of Fisheries and Aquatic Resources, aimed to: (1) regenerate coastal resources, rehabilitate the coastal environment and alleviate poverty among municipal fishers, particularly through diversification of their sources of income; (2) intensify aquaculture production – particularly for the benefit of domestic consumption – within the limits of ecological balance; and (3) induce commercial fishing away from overfished nearshore areas into offshore waters.

The components of the FSP were fishery resource and ecological assessment, coastal resource management, income diversification, research and extension, law enforcement, credit and infrastructure. The programme was implemented in twelve priority bays for CRM and six priority regions for aquaculture. The twelve bays were Manila Bay, Calauag Bay, San Miguel Bay, Tayabas Bay, Ragay Gulf, Lagonoy Gulf, Sorsogon Bay, Carigara Bay, San Pedro Bay, Ormoc Bay, Sogod Bay and Panguil Bay. The six regions were Regions 1, 3, 4, 5, 6 and 9.

The programme gave wider latitude to LGUs in making institutional and operational arrangements. It laid the groundwork for future resource management projects and programmes.

The programme reported an increase in the household incomes of local fishing communities attributed to non-fishing livelihood activities. It promoted resource rehabilitation activities such as fish sanctuary establishment and mangrove reforestation, which also served as focal points for community participation. In line with the provisions of the Local Government Code, fishing ordinances were enacted in order to strengthen law enforcement capabilities of the LGUs. Local interagency, multisectoral resource management councils (bay management councils) were created in the twelve bays. Fisherfolk organizations and associations were also formed. CRM planning as a basic tool for resource management was adopted by the LGUs. The results of the Resource and Ecological Assessments (REAs) conducted in the twelve priority bays provided the scientific basis for the formulation of the baywide management plans and for the establishment of a database. The higher level of awareness and knowledge of resource management enabled the key stakeholders to actively participate in the resource management activities. This proved to be a viable tool for the sustainability of activities in resource management.

FSP Project Completion Report, 1996.
The programme worked on institutionalising CRM policy reforms at the local level while also pursuing changes at the national level. It should be noted that from the start, the programme pushed for the formulation of a new fisheries code. The integration of the various sectors and disciplines into the management framework gave better credence to the overall programme, and led to the synchronization of related activities into the national programmes. However, the credit and alternative livelihood aspects of the programme faced some difficulty in accessing the credit seed fund, which was channelled to government commercial banks. These banks followed their own lending processes and this hindered the immediate utilization of the funds.

5.1.3 Coastal Environment Programme (CEP) – 1993 to on-going

The Coastal Environment Programme of the Department of the Environment and Natural Resources aims to institutionalize CRM within its organizational structure, based on principles of sustainable development, biodiversity and resource sharing. It also aims to strengthen the link between the upland ecosystem and the coastal ecosystem under a watershed-based management approach. The CEP is being implemented throughout the country through DENR’s regional and provincial activities.

For its success, the CEP is banking on the sharing of responsibility for the management of natural resources with other stakeholders, especially the local communities and LGUs. At the local levels, it works through a decentralized structure.


The CRMP of the Department of Environment and Natural Resources aims to promote improved national policies and laws on CRM, and increased awareness of CRM problems and solutions. The project is being implemented in six learning sites, namely: Palawan Province, Davao del Sur Province, Olango Island, Cebu Province, and Sarangani Province.

The policy component of the CRMP focuses on promoting national policies that will improve coastal management through the country. The information, education and communication (IEC) component supports all aspects of the project through various IEC activities. Multisectoral collaboration among government agencies, private sector, civic groups and the government to promote education and awareness on CRM is also encouraged.

The CRMP has developed a “state-of-the-art” knowledge of CRM implementation, and aims to institutionalise CRM implementation within the LGU structure. It has an effective IEC component that actively engages in awareness and education campaigns. As manifested by its active participation in the conference of municipalities, the project was able to integrate CRM into the national policy agenda. The project has also spearheaded the multiagency group that every other year chooses the municipalities that have adopted best CRM practices.

5.1.5 Community-based Coastal Resource Management Project (CBCRMP) – 1998 to 2003

The CBCRMP of the Department of Finance was conceived to reduce rural poverty and environmental degradation through support for locally generated and implemented natural resource management projects. These objectives would be pursued through: (1) enhancing the capacity of low-income rural local government units and communities to plan, implement and sustain priority natural resource management projects; (2) strengthening central government systems to transfer finance and environmental technology, and improve the implementation of environmental policies; and (3) providing resources to LGUs to finance natural resource management projects. The CBCRMP is being implemented by the Department of Finance through various partner agencies — DENR, DA, BFAR, DILG/LGA, BLGF and NEDA. These partner agencies implement the project through their existing regional and local staff in areas where subprojects are being undertaken. The CBCRMP adopts the demand-driven approach and LGUs are encouraged to submit proposals for subprojects on natural resources management and livelihood development. These subprojects are prioritized to respond to local situations. This approach allows the LGUs to take the “driver’s seat” in project implementation.

At present, subprojects are being implemented in Regions 5, 7, 8 and 13. The national and regional agencies together with the LGUs monitor and evaluate the status of the subprojects.

5.1.6 Fisheries Resource Management Project (FRMP) – 1998 to 2004

The FRMP of BFAR addresses two critical issues of fisheries resource depletion and poverty among municipal fisherfolk. The project focuses on reversing the trend of fisheries resource depletion by controlling illegal fishing and overfishing. The

31 FRMP Primer, 1999.
project adopts a gradual approach that will (1) reduce the level of user competition by restricting new entrants to municipal fisheries through fish licensing; (2) reduce fisherfolk’s reliance on fishing by promoting income diversification, which may reduce fishing time and change fisherfolk from full-time to part-time fisherfolk; and (3) through the promotion of mariculture and the development of other commercial enterprises in the long term, facilitate the gradual exit from fishery of some fisherfolk, although slowly and in limited numbers. The project represents the government’s effort to shift the sector from increasing capture fisheries production to fisheries resource protection, conservation and sustainable management. It reflects the demand of municipal fisherfolk for public assistance to protect their basic livelihood, and the national and local government’s concern over poverty and environmental degradation. The project is based on the foundations laid down by the Fisheries Sector Programme (FSP) and the various programmes initiated by local communities and LGUs.

The FRMP covers 100 municipalities in 18 bays, namely: Calauag Bay, San Miguel Bay, Tayabas Bay, Ragay Gulf, Lagonoy Gulf, Sorsogon Bay, Carigara Bay, San Pedro Bay, Ormoc Bay, Sogod Bay, Pangui Bay, Honda Bay, Puerto Princesa Bay, Davao Gulf, Lingayen Gulf, Gingoog Bay, Butuan Bay and Sapian Bay. The three components of the project are (1) fisheries resource management, (2) income diversification and (3) capacity building.

The fisheries resource management component aims to strengthen fisheries regulation, rationalize the utilization of fisheries resources, and rehabilitate damaged habitats. The interrelated elements of this component are data management, CRM planning and implementation, fisheries legislation and regulations, community-based law enforcement and nearshore monitoring, control and surveillance. The income diversification component promotes income diversification for municipal fisherfolk by organizing self-reliant community groups, promoting microenterprises and supporting mariculture development. The capacity building component aims to strengthen the capacity of executing and implementing agencies at the national, regional and local levels for fisheries resource management in the long term. To achieve its objectives, the project adopts the two-tiered strategy of (1) providing training courses and seminars to implementers and (2) providing on-site coaching in actual project implementation.

5.1.7 Other fisheries/coastal resource management initiatives

There are a number of fisheries/coastal resource management initiatives undertaken by local and international NGOs, POs, LGUs and the academe. While attempts have been made to review and evaluate these initiatives, the lack of proper documentation does not allow for their detailed and in-depth evaluation. Furthermore, each initiative has devised its own parameters for review and evaluation, thus limiting a comparative analysis across sites.

5.2 Management interventions

The framework for the implementation of resource management adheres to a holistic approach. It recognizes the interrelationships and interdependencies of the physical, biological, sociocultural, economic, legal and institutional factors affecting the entire ecosystem. The role played by coastal communities, government agencies, LGUs, NGOs, POs, FARMCs and other civic organizations is underscored. Various policies have been instituted to attain the effective implementation of coastal resource management in the country. Some of the policies relevant to fisheries management are:

- decentralization of management of nearshore fisheries resources to municipalities and local fishing communities;
- strengthening of the enforcement of fisheries laws by organizing municipal-based interagency law enforcement teams composed of representatives from fisherfolk association, non-governmental organizations, local government units, Philippine Maritime Police, Philippine Coast Guard, Bureau of Fisheries and Aquatic Resources, the Department of Environment and Natural Resources, the private sector and other concerned agencies/institutions;
- promotion of community-based initiatives to rehabilitate, conserve and protect the coastal resources;
- diversification of the source of income of fisherfolk towards other income opportunities; and
- expansion of extension services to form closer linkage between and among the fisherfolk, research institutes and other beneficiaries.

The implementation of any intervention is an activity of the coastal community. Oftentimes, the intervention serves as the focal point for any group activity in the coastal community. A strong and knowledgeable local group or organization is
needed to ensure the sustainability of the intervention.

5.2.1 Marine Protected Areas (MPAs)
The importance of coastal and marine resources in sustaining life is a paramount concern. However, degradation and destruction of these resources continue due to both natural and human-made causes. Several initiatives, especially in the Visayas and Mindanao, are focused on the protection and the biodiversity of the marine ecosystem.

In order to ensure the continued existence of coastal resources for future generations, the government promoted the establishment of marine protected areas (MPAs). MPAs may be fish/marine sanctuaries, marine reserves, marine parks or mangrove reserves. These are usually “no take” zones or regulated use zones. The Fisheries Code embodies the establishment of MPAs in municipal waters, where applicable. The MPAs are usually implemented through community-based organizations (CBOs) formed at the barangay level. The CBOs are responsible for the demarcation of the area and the enforcement of regulations. The CBOs also coordinate management efforts with the municipal and national governments, as well as with the academe and other partners. A prescribed general procedure in the establishment of MPAs is followed.

After about 20 years of experience and about more than 400 MPAs all over the country, there is no established number of successful MPAs. The lack of monitoring tools to assess the MPAs, especially at the LGU level, makes it difficult to evaluate the success or failure of MPAs.

5.2.2 Fisheries licensing
The Fisheries Code is very explicit in its provisions on the licensing system. Fisheries licensing will be undertaken at two levels – national and local. The national government (BFAR) issues licenses to commercial fishing vessels; the local government unit issues licenses to municipal fishing vessels. Licensing at the local level is embodied in the Municipal Fisheries Ordinance (MFO) enacted by the Municipal Council. At present, public consultation is being carried out to discuss the Model Municipal Fisheries Ordinance (MMFO) developed by the FRMP to serve as a guide to LGUs in the formulation of their own ordinance. The enactment of their MFO will enable LGUs to implement policy reforms on regulating fishing efforts in areas within their jurisdiction. Through their MFO, LGUs will also be able to implement the licensing system for municipal fisherfolk.

5.2.3 Limited access fisheries
Traditionally, the country’s waters are open to all fisherfolk. There is a belief that anybody can fish in any part of the country. This belief, however, has resulted in the overfishing of most bays and gulfs in the Philippines. In recent years, the concept of limited access by various means has been adopted by NGOs advocating community property rights (CPR) as the viable option for coastal resource management that benefits the most marginalized fisherfolk. CPR places the community within the decision-making process in the implementation of coastal resource management. Tambuyog, an NGO that advocates CPR has started CPR projects in Malampaya Sound, Palawan; Pagapas Bay, Batangas; and Orion, Bataan. Tambuyog has also worked with many local NGOs and people’s organization to spread the concept of CPR.

5.3 Information, Education and Communication (IEC)
Comprehensive IEC is a key element for successful community-based coastal resource management. Through comprehensive IEC, the goals, objectives and strategies of resource management are disseminated to all stakeholders, especially the target beneficiaries. Most coastal communities lack knowledge on marine ecology and environmental conservation and management. Most fisherfolk think that resources are inexhaustible despite decreasing catch from the capture fisheries. Existing IEC activities are not sufficient to disseminate marine resource management concepts throughout the country. A broad information and education campaign is needed to have an effective and wider participation from the coastal communities. IEC takes various forms such as print, radio broadcast and audio-visual. Education may be formal or informal. It is usual for community-based resource management initiatives to start with a massive IEC campaign at all levels.

Effective IEC goes hand in hand with efficient data gathering, storage, analysis and application. The Philippine Fisheries Information System (PhilFIS) infrastructure is used by the FRMP for its IEC data collection, processing and dissemination activities. The PhilFIS is similarly utilized by NGOs, POs, the academe and other government agencies.

5.4 Marine and fisheries research
Marine and fisheries research aims to establish an accurate and reliable basis for the sustainable use and management of nearshore marine resources. A scientific basis is required for the rational
utilization and management of fisheries resources. It is important, therefore, that data sets are available for the development of practical and technically sound CRM plans to be implemented in specific sites.

The cyclical process of CRM planning starts with gathering available information regarding the resources. Most surveys start with an initial rapid site survey and follow with a more comprehensive survey. In both cases, information on the status of the resources as well as the existing social and institutional make-up of the sites is gathered.

The BFAR, working hand-in-hand with a number of state universities and colleges, local government institutions, local and international NGOs, is now conducting a resource and social assessment (RSA) of the bays and gulfs within the FRMP project. Coupled with the RSA is the development of a resource database within the PhilFIS. The CRMP has also initiated a data banking system in their six learning sites.

6. COMMUNITY-BASED RESOURCE MANAGEMENT OR CO-MANAGEMENT AS AN APPROACH TO FISHERIES MANAGEMENT

Coastal resource management (CRM) is the overall approach used for planning the rehabilitation and regeneration of the degraded coastal resources. The implementation of CRM promotes the active participation of the coastal community and the local government units, hence, the community-based coastal resource management (CBCRM) concept of resource management.

About ten years ago, the national government made very little effort to involve coastal communities in resource management. Today, community-based initiatives promote wider participation of stakeholders at the community level. The various stakeholders in the area are given the opportunity to determine their problems and identify management strategies to address these problems.

People participation is one of the important elements of successful fisheries management. Coordination between and among stakeholders is important so that the limits of the resource system or bay area are considered in the overall level of resource exploitation.

Community participation in community-based coastal resource management involves essential elements, namely:

- **integration** which entails informal meetings to familiarize the coastal communities with the project or activities;
- **education** to counteract the low levels of awareness and poor understanding of environmental issues among the coastal communities;
- **core group building** for resource management necessary to support activities of the project;
- **responsibility building** around beneficial projects that will involve the community in resource management activities; and
- **improved law enforcement** where CBCRM emphasizes the participation of the coastal communities in law enforcement.

6.1 Community organizing

Community organizing (CO) as a strategy aims to raise awareness within coastal communities of the concepts of fisheries resource management. It is premised that to enable the coastal community to engage in productive and profitable ventures, a new mind-set or cognitive orientation is required. CO is usually linked with the entry of NGOs in the area of project operation. However, some NGOs are perceived to promote their own interests rather than the community’s interests. CO work must be focused on institutionalising a more effective and efficient use of human resources to help people attain their goals on fisheries management. The CO must be able to assist the community in adapting to the changing conditions of the coastal environment. CO has dual tasks. One task is to prepare the communities to be actively involved in fisheries resource management; the other task is to support the community in its involvement in viable economic activities.

Basic requirements for the success of fishers’ organizations include: (a) mass participation, (b) strong and devoted leadership, (c) multipurpose functions, (d) equitable distribution of benefits, (e) homogeneity, and (f) business management skills. In addition, such organizations must evolve from the perceived needs of target beneficiaries. Imposition from above has often been found to cause failure. The concept of delegating management authority to fishers’ organizations to increase community participation in fishery management might provide a challenging rationale, however past experiences in cooperative development projects cannot warrant immediate transfer of such responsibilities to fishers’ organizations at this stage. Visible changes in business management capabilities and in attitudes
need first to be assured before this concept is institutionalized.

There are 15 national federations and fishers’ associations (FAs), 14 regional and over 200 provincial associations. There are also fisheries cooperatives (FCs) at the barangay or municipal level. Aquaculture has a national federation with counterparts in all regions. The major functions of FAs are for provision of supplies, credit, and marketing. External donors often provide credit. Experience shows that after funding had been granted or when marketing or production agreements failed, members lost interest and the groups were disbanded.

The need to work with NGOs is recognized by the government as an important element in the implementation of fisheries resource management. The national government does not have enough human resources or the capability to undertake the tasks involved in community organizing, hence the engagement of NGOs. However, caution must be taken to avoid that the community does not become totally dependent on the NGO.

6.2 Income diversification

The need to reduce overall fishing effort has become a “bitter pill” among fisherfolk. Though the need to decrease fishing effort is recognized by most fisherfolk, leaving the fishing ground has been a difficult option. Income diversification initiatives have been initiated in various coastal communities to provide the marginal fisherfolk with alternative or supplemental livelihood.

Income diversification is better achieved through good community organizing (CO) and focusing on the social mobilization of fisherfolk. There is a need to strengthen the community groups that are savings-based and self-reliant. In the end, the community must be able to carry out fisheries management activities and pursue income diversification on a long-term basis. The promotion of microenterprises and mariculture development is encouraged even at the community level.

6.3 Capability building

Capability building is a very important part of management. The success of fisheries management is determined by the national and local capacity to effect changes towards CRM. Because fisheries resource management is multisectoral, there is a need to share roles and responsibilities in the implementation of its subcomponents. Able and qualified personnel, both at the national and local levels, are needed to implement the CRM activities and at the same time perform extension services at the community level.

In most cases, capacity building is carried out through formal and non-formal methodologies. Formal education is achieved by coordinating with schools to include coastal resource management in their school curricula. However, there is a limitation to the extent that existing curricula can accommodate CRM human resources needs. A more extensive method to improve human resources capacity is through training. Training should target at providing stakeholders with the tools for resource management. The existing organizations and associations (FARMCs) should be strengthened and should enjoy sustainable assistance from the national and regional governments.

7. AGENCIES AND INSTITUTIONAL ARRANGEMENTS

Implementation of existing management regulations and policies becomes more effective when there is coordination among the involved agencies and institutions. All government agencies and institutions involved in the conservation and protection of coastal and marine resources have their respective mandates to plan activities geared towards the conservation, protection and management of coastal resources. These mandates transform into specific functions, which can be categorized into the following: (a) policy making/general management function, (b) scientific function, (c) research function, and (d) law enforcement and coordination function.

- The government agencies and institutions with policy making/general management functions are the following:
  - the Department of Environment and Natural Resources (DENR), which has overall responsibility for the environmental protection and management of both the marine and coastal environment;
  - the Department of Agriculture (DA)33, which has jurisdiction over the conservation and proper utilization of agricultural and fishery resources;
  - the Local Government Units (LGUs)34, which by virtue of the devolved LGC of 1991 have

---

33 Under its sectoral programme, the Department of Agriculture through the Bureau of Fisheries and Aquatic Resources is implementing a fisheries management system known as Fisheries Resource Management Programme (FRMP) in 18 priority bays.
34 The increased power of the LGUs derives from the expansion of their jurisdiction over municipal waters up to 15 kilometres.
been given the exclusive authority to grant fishery privileges in the municipal waters;

- the Autonomous Region of Muslim Mindanao, which under the Organic Act of Muslim Mindanao (RA 6734) has been given full control over natural resources management in the region, except for some strategic resources;
- the National Economic Development Authority (NEDA), which coordinates various social and economic plans, policies, programmes and projects of the country on a national and sectoral basis.

Scientific and research functions are held by:

- the Department of Science and Technology–Philippine Council for Aquatic and Marine Research and Development (DOST–PCAMRD), which is a policy-formulating and coordinating body for aquatic and marine science and technology development;
- the DA–BFAR, which is the main coordinating body for all research conducted by the DA;
- the DENR–Ecosystem Research and Development Bureau (ERDB), which is DENR’s research coordinating unit; and
- the University of the Philippines–Marine Science Institute (UP–MSI), which is the national centre for excellence in the marine science.

The government agencies and institutions with law enforcement and coordination functions include:

- the Department of the Interior and Local Government–Philippine National Police (DILG–PNP), which is lodged with the general responsibility of crime prevention and the apprehension of violators;
- the Department of National Defence (DND)–PCG, which has the primary role in the prevention and control of marine pollution;
- the Bantay-Dagat Committee (BDC), which mainly engages in law enforcement in coastal waters;
- the Interagency Task Force on Coastal Environment Protection (IATFCEP), which coordinates the departments and agencies enforcing coastal environment protection;
- the Department of Foreign Affairs (DFA), which heads the Cabinet Committee on Marine Affairs which addresses the various concerns on the implementation of the UNCLOS.

8. CHALLENGES IN FISHERIES AND COASTAL RESOURCE MANAGEMENT

The multisectoral and multidisciplinary nature of resource management demands wider interaction among the actors in fisheries and coastal management. The various institutions that participate in the entire process of management are faced with constraints at various levels. The major institutional problems that have been identified are as follows:

- an overlap of mandates and functions for fishery and fishery-related matters among different departments of the executive branch;
- lack of human resources to accommodate the mandates of fisheries management within the structural and organizational frameworks of the agencies tasked to implement fisheries management at both national and local levels;
- absence of a clear delineation of boundaries between municipalities;
- lack of effective coordination between and among the national government and local governments (national–local coordination);
- lack of fishery resource management and law enforcement capabilities among local governments;
- dearth of capable and qualified human resources to implement management;
- lack of harmonization of government policies on development and management (e.g. industrialization as a development strategy contradicts management, which aims to maintain ecologically sound technology);
- lack of provision for viable livelihood options;
- insufficient budgetary support to carry out effectively identified functions and responsibilities of agencies; and
- minimal participation of fishery resource users at various levels of institutional decision-making.

At present there are management issues that the local government units have to address. These include:

- declining fisheries productivity due to over harvesting and loss of habitats;
- rapid population growth and migration to coastal areas;
- increasing environmental damage;
- low levels of awareness of the real causes of environmental problems and of the effective
The implementation of fisheries and coastal resource management is the responsibility of not only one or two agencies – multiple agencies are involved. Management goals can be more effectively achieved through the concerted efforts of the various stakeholders. It should be underscored, however, that the coastal community, the local government units, the people’s organizations and other major groups are the direct stakeholders. They have a greater interest in the resources. It is therefore imperative that these groups take the lead role in fisheries and coastal management, with other minor stakeholders providing and facilitating assistance to them.
REFERENCES


Part 3

Case studies on the use of demographic and socio-economic indicators in coastal management
Case Study 1

Use of socio-economic and demographic information for coastal management in Puget Sound, Washington State, USA

by Steve Tilley, MSPH, AICP*

1. INTRODUCTION
This paper was written to accompany the FAO Fisheries Technical Paper No. 439. FAO Technical Paper No. 439 provides guidelines for the collection of demographic and socio-economic information on fishing communities for use in coastal and aquatic resources management. While conditions in Puget Sound are very different from the target areas for the Technical Paper, the Puget Sound experience may provide useful insights into how data can be used in developing performance indicators.

The Puget Sound basin covers more than 16 000 square miles and is located in the northwestern United States of America. Around 4 million people live in the basin. A complex network of federal, state and local laws govern the use of Puget Sound’s coastal resources. Significant aspects of the Puget Sound ecosystem have been heavily impacted by urban and rural development and by harvesting of upland and aquatic resources. However, the Sound still has many high quality fresh and marine water bodies and hosts a diverse community of aquatic life.

* Steve Tilley is currently employed as Deputy Director of the Coastal Resources Management Program of the Commonwealth of the Northern Marianas Islands. E-mail: stevetilley@futurecoast.net. Previously, Steve worked for 27 years in land use and coastal management programs for local and state agencies in Washington State. He also served as Senior Advisor to Proyek Pesisir (Coast Project), Indonesia from 1999 to 2003. Many thanks to Rose Curran, Ph.D. of King County (rose.curran@metrokc.gov, Tel +1-206-205-0715) and Astrid Scholz, Ph.D. of Ecotrust (PO Box 29189, San Francisco, CA 94129, USA, Tel +1-415-561-2433, ajscholz@ecotrust.org) for their great assistance in preparing this paper. Graphics were prepared by Toni Weyman Droscher.
2. GROWTH MANAGEMENT BENCHMARKS

In 1990, the Washington Legislature adopted the Growth Management Act (GMA). The Legislature feared that uncoordinated and unplanned growth would threaten the economy, environment and health and safety of the state’s residents. Rapid growth in the 1980s had produced urban sprawl, congested streets, flooding, loss of farmland, polluted shellfish beds and loss of critical habitats.

The GMA provides a policy framework and tools for land-use planning conducted by local governments (counties and cities). In Washington, counties are general-purpose local governments that may include one or more cities. In relation to land-use planning, cities and towns have authority to plan within their boundaries and counties are responsible for planning for areas outside city boundaries.

The basic objectives of the GMA are to “manage and direct growth to urban areas where public facilities and services can be provided most efficiently, to protect rural character, to protect critical areas, and to conserve natural resource lands.” Specific GMA goals address urban growth, sprawl, transportation, housing, economic development, property rights, permits, natural resource industries, open space and recreation, environment, citizen participating and coordination, public facilities and services, and historic preservation.

Within this state policy framework, local governments develop policies, plans and regulations to manage land development and to guide infrastructure investments. At the beginning of the programme, each county worked with the cities in the county to adopt countywide policies. The policies below provide guidance and coordinate development objectives among the counties and their cities and towns:

- Implement urban growth boundaries.
- Promote an orderly provision of urban services to urban development areas.
- Site public capital facilities of a countywide or statewide nature.
- Provide countywide transportation.
- Assure adequate, affordable housing.
- Enable joint city/county planning within urban growth areas.
- Encourage countywide economic development.
- Analyse fiscal impact.

Once they began planning, the counties, cities and towns conducted studies on land use, economy, housing, environment, and other issues. They designated urban growth areas outside of which urban development will not occur. They developed comprehensive land-use plans that include specific chapters to address land use, housing, capital facilities,
utilities, transportation, rural lands (for counties) and shorelines. Comprehensive plans must be consistent with the GMA, with countywide planning policies, and with the plans of adjacent jurisdictions. Development regulations and individual developments must be consistent with the comprehensive plan. The overall growth management system is shown in Figure 2.

The state and local governments collect demographic and socioeconomic data to track implementation of the GMA. Two examples are described here – population growth and local benchmarks.

2.1 Population growth
A key requirement of the GMA is that counties, cities and towns allocate adequate land area to accommodate the projected 20-year population growth. Initially, the state projected population growth and allocated a portion to each county. The state projection was expressed as a high and low range within which local governments could target their growth (see Figure 3). Counties worked with cities and towns to allocate the population growth among them. Now, the state tracks actual population growth and updates the population forecasts every five years. Local governments adjust their population allocations and development plans, as necessary. The population that needs to be accommodated by a given area depends on:

- the growth range projected by the Washington Office of Financial Management;
- the planning target within that range selected by the county;
- how the local governments in each county allocate growth.

2.2 Growth management benchmarks
Growth management benchmarks are another approach to the use of demographic and socioeconomic information. The GMA requires counties, in consultation with cities, to adopt countywide policies as a framework for adoption of county and city comprehensive plans. These policies are to include policies on review and evaluation to determine whether urban densities are being achieved and to identify reasonable measures, other than adjusting urban growth areas, which will be taken to comply with the requirements of the GMA. Under this authority, “counties and cities may establish indicators, benchmarks, and other similar criteria to use in conducting the evaluation.”

King County (Figure 1), on the eastern shore of Puget Sound, provides an example of how benchmarks can be used to track implementation of countywide policies. With a total population of 1.8 million, the county is the thirteenth largest in the United States of America. Seattle is the biggest city in the county with a population of nearly 600 000 while the unincorporated area of the county has 350 000. The remaining population is divided among 38 other cities and towns. Cities and towns are subject to state laws but are largely independent of the county. Seattle is a major seaport: Port-related operations accounted for more than 83 000 jobs in 1999.

King County, together with its cities, developed and adopted countywide policies in 1994 and the benchmark system in 1995. The purpose of the

---

42 State of Washington, 1997b.
benchmark system is to determine whether the countywide policies are achieving their intended outcomes, and whether the quality of life as measured by the indicators is improving, declining or holding steady. Table 1 shows the King County’s 2002 benchmark outcomes and indicators. The County tracked each indicator and has produced benchmark reports annually from 1996 through 2002. For each indicator, the report provides a definition, analyses the data, and explains what is being done about the issue (see Figure 4). An appendix identifies the source of the data and explains the rationale for each policy. A decision was made not to include targets for most indicators.

The King County Benchmark Programme looks at quality of life indicators rather than specific programme-level performance measures. The objective is to use high-level indicators to encourage better practice and improve results. The benchmark system, including the indicators, is intended to “provide early warning if the policies are not having their desired effects. In that case, the system should provide sufficient information to enable policy-makers to determine whether different actions to implement the policies are needed, or whether minor or major revisions to the policies are required. More specifically, the Benchmark System should be used to help the jurisdictions of King County establish priorities, take joint actions, and direct resources to solve problems identified in the Countywide Planning Policies.” To diagnose which actions need to be taken to solve specific problems, the county and cities rely on more specific performance monitoring at the department, agency and programme levels. The primary responsibility for programme and policy change rests with agency heads, programme directors and policy makers.

The process of developing the benchmarks was valuable in itself. The county worked hard to involve the public in building consensus and focusing on necessary strategies to achieve the desired outcomes. Technical task forces and stakeholders participated in developing the benchmarks. They started by considering more than 100 indicators and narrowed them to 45. Local elected officials believe that just the fact of monitoring process demonstrates that plans are being used and goals are kept alive. This allows them to make needed adjustments to programmes. Over time, the indicators are adapted to suit changing conditions. For example, in 2002, the county noted, “…some of the indicators have been omitted. In several cases, there is not yet any reliable trend data available for that indicator. Sometimes this reflects a lack of funding to collect the necessary information; in other cases, current data is being developed, but there is no data for comparison to the past. There are several other indicators which have been left out this year because there is no significant change in the data from one year to the next…in one or two cases, the indicators themselves may need to be reevaluated.”

The linkage between benchmark indicators and policy changes is becoming more formalized. The indicators report now goes to policy makers, the King County Council, planning directors, mayors, department heads, and others. Different people use data for different purposes. In some cases, policy makers use the information as the basis for policy change.

Benchmark reports have stimulated policy changes. The reports showed that land use policies were permitting too many units in rural areas compared to long-term targets. Local governments then tightened zoning and regulations and the rate of development in rural areas declined. In another case, benchmark reports showed a lack of affordable housing and inequitable distribution around the county. The county conducted a survey and identified strategies that would increase the stock of affordable housing and publicized the information. In a third case, the benchmark reports highlighted a decline in high school graduation rates from the late 1980s to the late 1990s. Policy makers eventually became quite concerned; the benchmark reports raised consciousness in the county even though the county government didn’t have a direct control over the education system.

King County identified the following main challenges of their monitoring programme:

- “choosing the best benchmarks;
- enlisting cooperation of cities and departments;
- deciding whether or not to set a target;
- getting high quality data (or any!);
- establishing trends over sufficient time;
- analysing: what the numbers mean;
- recognizing both success and failure;
- communication back to planners, programme directors, and policy-makers;
- implementing change.”


TABLE 1
2002 King County benchmark outcomes and indicators

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ECONOMIC DEVELOPMENT</strong></td>
<td></td>
</tr>
<tr>
<td>Promote family-wage jobs</td>
<td>1. Real wages per worker</td>
</tr>
<tr>
<td>Increase income and reduce poverty</td>
<td>2. Personal and median household income: King County compared to the United States of America</td>
</tr>
<tr>
<td></td>
<td>3. Percentage of population below the poverty level</td>
</tr>
<tr>
<td>Increase business formation, expansion and retention</td>
<td>4. New businesses created</td>
</tr>
<tr>
<td></td>
<td>5. New jobs created by employment sector</td>
</tr>
<tr>
<td>Create jobs that add to King County’s economic base</td>
<td>6. Employment in industries that export from the region</td>
</tr>
<tr>
<td>Increase educational skill level</td>
<td>7. Educational background of adult population</td>
</tr>
<tr>
<td></td>
<td>8. High school graduation rate</td>
</tr>
<tr>
<td><strong>ENVIRONMENT</strong></td>
<td></td>
</tr>
<tr>
<td>Protect and enhance natural ecosystems</td>
<td>9. Land cover changes in urban and rural areas over time</td>
</tr>
<tr>
<td></td>
<td>10. Air quality</td>
</tr>
<tr>
<td>Improve air quality</td>
<td>11. Energy consumption</td>
</tr>
<tr>
<td></td>
<td>12. Vehicle miles travelled per year</td>
</tr>
<tr>
<td></td>
<td>13. Surface water quality</td>
</tr>
<tr>
<td>Protect water quality and quantity</td>
<td>14. Water consumption</td>
</tr>
<tr>
<td></td>
<td>15. Change in groundwater levels and quality</td>
</tr>
<tr>
<td>Protect wetlands</td>
<td>16. Change in wetland acreage and functions</td>
</tr>
<tr>
<td>Protect the diversity of plants and wildlife</td>
<td>17. Continuity of terrestrial and aquatic habitat networks</td>
</tr>
<tr>
<td>Increase salmon stock</td>
<td>18. Change in number of salmon</td>
</tr>
<tr>
<td>Decrease noise levels</td>
<td>19. Rate of increase in noise from vehicles, planes and yard equipment</td>
</tr>
<tr>
<td>Decrease waste disposal and increase recycling</td>
<td>20. Pounds of waste disposed and recycled per capita</td>
</tr>
<tr>
<td><strong>AFFORDABLE HOUSING</strong></td>
<td></td>
</tr>
<tr>
<td>Provide sufficient affordable housing for all King County residents</td>
<td>21. Supply and demand for affordable housing</td>
</tr>
<tr>
<td></td>
<td>22. Percent of income paid for housing</td>
</tr>
<tr>
<td></td>
<td>23. Homelessness</td>
</tr>
<tr>
<td></td>
<td>24. Apartment vacancy rate</td>
</tr>
</tbody>
</table>
### TABLE 1 (cont.)
2002 King County benchmark outcomes and indicators

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AFFORDABLE HOUSING</strong></td>
<td></td>
</tr>
<tr>
<td>Promote affordable home ownership opportunities</td>
<td>25. Home purchase affordability gap for buyers with (a) median renter household income and (b) median household income</td>
</tr>
<tr>
<td></td>
<td>26. Home ownership rate</td>
</tr>
<tr>
<td></td>
<td>27. Trend of housing costs versus income</td>
</tr>
<tr>
<td>Promote equitable distribution of affordable low income housing throughout King County</td>
<td>28. Public dollars spent for low income housing</td>
</tr>
<tr>
<td></td>
<td>29. Housing units affordable to low income households</td>
</tr>
<tr>
<td><strong>LAND USE</strong></td>
<td></td>
</tr>
<tr>
<td>Encourage a greater share of growth in urban areas and urban centres, limit growth in rural/resource areas</td>
<td>30. New housing units in urban areas and rural/resource areas, and in urban centres</td>
</tr>
<tr>
<td></td>
<td>31. Employment in urban areas, rural/resource areas, urban centres and manufacturing/industrial centres</td>
</tr>
<tr>
<td>Make efficient use of urban land</td>
<td>32. New housing units built through redevelopment</td>
</tr>
<tr>
<td></td>
<td>33. Ratio of land consumption to population growth</td>
</tr>
<tr>
<td></td>
<td>34. Ratio of achieved density to allowed density of residential development</td>
</tr>
<tr>
<td>Accommodate residential and job growth in urban areas</td>
<td>35. Ratio of land capacity to 20-year household and job targets</td>
</tr>
<tr>
<td></td>
<td>36. Land with six years of infrastructure capacity</td>
</tr>
<tr>
<td>Encourage liveable, diverse communities</td>
<td>37. Acres of urban parks and open space</td>
</tr>
<tr>
<td>Balance job and household growth</td>
<td>38. Ratio of jobs to housing in Central Puget Sound counties, and King County subregions</td>
</tr>
<tr>
<td>Maintain quality and quantity of natural resource lands</td>
<td>39. Acres in forest land and farm land</td>
</tr>
<tr>
<td></td>
<td>40. Number and average size of farms</td>
</tr>
<tr>
<td><strong>TRANSPORTATION</strong></td>
<td></td>
</tr>
<tr>
<td>Transportation and land use linkage</td>
<td>41. Percent of residents who commute one-way within 30 minutes</td>
</tr>
<tr>
<td>Availability of modes other than single occupant vehicle</td>
<td>42. Metro transit ridership</td>
</tr>
<tr>
<td>Mode split</td>
<td>43. Percent of residents who walk or use transit, bicycles or carpools as alternatives to the single occupant vehicle</td>
</tr>
<tr>
<td>Reduce commercial traffic congestion</td>
<td>44. Ability of goods and services to move efficiently and cost effectively through the region</td>
</tr>
<tr>
<td>Protect and improve transportation infrastructure</td>
<td>45. Number of lane miles of city, county, and state roads and bridges in need of repair and preservation</td>
</tr>
</tbody>
</table>

Source: Growth Management Planning Council and Office of Management and Budget, 2002
There are several other Puget Sound examples of using indicators to track the sustainability of development. However, neither of the following cases has a direct programme link between the indicators and programme decision-making.

The City of Olympia, Washington produced *State of the Community* reports in 1996, 1998 and 2003.\(^{49}\) Now, the City is moving to a benchmarks/performance measures project for each department. The 2003 report will be put on the Internet to educate citizens and help them become more aware and involved.\(^{50}\)

Pierce County, Washington developed a benchmark system and produced reports to assess the community’s quality of life.\(^{51}\) The project collected and analysed annual data from 1989 onwards and produced indicator reports in 1994, 1995 and 1996. 1990 served as the benchmark year from which changes were measured. Topics covered were housing, air, water, waste, culture, recreation, education, transportation, jobs, businesses, crime, health and land use. The data is still available on the Internet but the project has been disbanded because it was not being used. This is a good caution in collecting data and producing indicators: If not official sanction, they must have visibility, political support and utility.

The Sustainable Community Roundtable illustrates a non-governmental approach in the

\(^{49}\) I. Melmore, personal communication, 2003.
\(^{50}\) City of Olympia, 2003.
\(^{51}\) Pierce County, 1998.
evolution of indicators. Initiated by the City of Olympia in 1991, the Roundtable was incorporated as a non-profit organization in 1992.

The Roundtable conducted extensive consultations with the community about indicators of sustainability in the areas of housing, economy, energy, etc. *State of the Community* reports were reproduced annually from 1993 to 1999. *Sustainable Seattle* is another non-governmental indicators project with a long history.

### 3. PUGET SOUND SHELLFISH HARVEST

Tracking of shellfish harvest area in Puget Sound provides an example of environmental measures that are directly linked to socio-economic conditions. Washington State is the leading producer of farmed shellfish in the United States of America. The Pacific Shellfish Growers Association estimates the wholesale value of commercial oyster, clam, and mussel production in Puget Sound at about US$50 million per year. In addition to the economic value, shellfish in Puget Sound are also important to the region’s heritage and quality of life. In 1998, nearly a quarter of a million people harvested shellfish from Puget Sound’s beaches, taking around 700,000 pounds of clams and 900,000 pounds of oysters.

However, the continued viability of the commercial and recreational harvest depends on the water quality of Puget Sound. Contaminants from urban and rural sources can render shellfish unfit for human consumption. Since 1980, around a quarter of the area classified for commercial shellfish harvesting has been downgraded and taken out of production. The primary problems were: inadequately treated sewage from municipal and on-site systems; contaminated stormwater runoff; and waste from marinas, boaters, farm animals, and wildlife.

Many entities are involved in protecting and restoring shellfish as an economic and recreational resource. These include state agencies, tribal and local governments, universities, shellfish growers, citizen committees and non-profit organizations. Intervention programmes include enforcing water pollution laws, overseeing shellfish harvesting, providing financial and technical assistance to tribal and local governments, research and public education.

Monitoring and classifying shellfish beds are critical components of this effort. The Washington Department of Health publishes annual growing area reports and the *Annual inventory of commercial and recreational shellfish areas of Puget Sound*. This provides information on water quality conditions and highlights areas threatened.

---

52 Sustainable Community Roundtable, 1998.
by contamination and classification downgrades. These reports provide an early warning that state agencies use to alert and work with local governments in protecting and restoring shellfish beds.\(^56\)

Figure 5 outlines the programme for maintaining the health of shellfish beds. Annual monitoring identifies areas needing special attention; other programmes address pollution sources in all locations. The indicator used here – area of shellfish beds approved for harvest, is not a direct socio-economic measure. However, it does measure the resource available to the industry. The shellfish industry works closely with the government agencies at all stages of this cycle to maintain approved harvest areas and to restore areas where harvest has been restricted.

The Department of Health (Health) classifies all commercial shellfish growing areas in Washington State as Approved, Conditionally approved, Restricted or Prohibited for harvest. These classifications have specific standards associated with them, which are derived from federal guidelines.\(^57\) From this information, Health produces a map and list of threatened shellfish growing areas (see Figure 6). This information also feeds into the technical report Puget Sound update and the popular Health of Puget Sound report produced by the Puget Sound Water Quality Action Team (Figure 7).\(^58\)

The Puget Sound water quality management plan establishes a system for state agencies and local and tribal governments to use the indicators to prevent contamination of shellfish areas. “When shellfish areas are identified as threatened in the annual growing area reports, the agencies and governments shall collaborate and target their actions to restore water quality and prevent classification downgrades. When shellfish areas are officially downgraded by [the Department of] Health, the state agencies, local and tribal governments, and other affected interests shall develop and implement closure response strategies to restore water quality and to upgrade the classifications.”\(^60\)

A 1992 state law also requires counties to establish shellfish protection districts to prevent contamination of shellfish areas when shellfish beds are downgraded due to non-point source pollution.\(^61\) Counties may also establish shellfish protection districts on their own. Once districts are established, counties may levy fees on residents of the districts to pay for activities to monitor, restore and protect shellfish beds. Examples of actions that counties take to restore and protect shellfish beds include inspecting on-site sewage systems, requiring and assisting in repair of on-site systems, educating about and requiring control of farm animal and pet waste, land-use planning to control the pattern and standards of upland development, and educating businesses and homeowners about use of pesticides and fertilizers.

---

\(^57\) U. S. Food and Drug Administration, 1999.
\(^58\) The Health of Puget Sound is printed as a newspaper insert and distributed to hundreds of thousands of newspaper subscribers.
4. WEST COAST GROUNDFISH FLEET RESTRUCTURING PROJECT

The Pacific Fishery Management Council (PFMC), a division of the United States Department of Commerce, manages the harvest of groundfish and other species on the west coast of the United States of America, including Puget Sound. A regional advisory council composed of stakeholders advises the PFMC. The fishery has four components: limited entry, open access, recreational, and tribal. Groundfish are managed through a number of measures including harvest guidelines, quotas, trip and landing limits, area restrictions, seasonal closures and gear restrictions (such as minimum mesh size for nets and small trawl footrope requirements for landing shelf rockfish).

After a period of initial expansion starting in 1976, fisheries on the United States West Coast, including groundfish landings, have been in severe decline since the early 1990s. In 2000, the PFMC adopted a strategic plan, Transition to Sustainability, which prioritises management options for ensuring the future of the fishery. The top priority was to reduce fishing capacity by at least 50 percent in each fishery sector. This would ensure that West Coast groundfish resources are fished in a sustainable manner while improving the economic stability of the groundfish fleet. By 2002, large areas of the upper continental shelf were closed to fishing, and a vessel buyback for the limited entry trawl fleet had been initiated.

Concerned about the socio-economic impacts on coastal communities, on the marine environment and on living resources, two regional non-profit organizations, the Pacific Marine Conservation Council and Ecotrust, partnered to conduct the Groundfish Fleet Restructuring Information and Analysis Project (GFR). GFR analysed options for reducing fleet capacity and changing the structure. These options were based on alternative scenarios and simulations that modelled the socio-economic effects on the fishing operators and affected coastal communities. These impacts could vary considerably from community to community, depending on local fleet composition, traditional target species, transportation, processing facilities and other portside infrastructure, and other factors. Any change in the composition of the fishing fleet and in the size, location and timing of fishing activity and effort along the coast would also affect the marine environment and living resources. The GFR was designed to assess these relationships and impacts, and to help inform the policy process. Figure 8 illustrates the relationships among the ecosystem, the fisheries and the coastal communities.

"The goals of the project were to:

- compile a comprehensive set of data and information in a format that can be used by all who wish to explore fleet reduction options and other management measures;

- produce a set of analytical, publicly available, tools including:

  (a) fleet reduction scenarios that consider fleet composition, shore-based infrastructure, harvest history, spatial dynamics and economic trends from the perspective of local communities;

![Figure 8: West Coast groundfish system and key relationships](source: Pacific Marine Conservation Council/Ecotrust, 2003 (p. 39))

(b) a matrix or simulation to analyse potential social and economic effects of these scenarios; and
(c) case studies illustrating different port profiles, empirical information on fishing and processing businesses, market dynamics, and the potential effects of fleet buyout proposals and other management measures;

- prepare a set of policy options as well as an executive report to be presented to the Pacific Fishery Management Council and made available to all interested parties.64

The project gathered and analysed historical and current information on the fishery (fleet composition, landings, stock assessments, habitat and gear interactions, etc.), port and community infrastructure (processing and freezer capacity, labour demographics, distribution and marketing networks, etc.) and ecological resources (essential habitat, spatial distribution of fish and fishing efforts over time, etc.). This information was entered into a spatially explicit analytical framework useful to communities and decision-makers. A CD-ROM with all data sets and metadata is available through the project website (http://www.ecotrust.org/gfr/index.html). Figure 9 illustrates the data layers collected.

With this information the project developed and analysed four fleet reduction scenarios:
(a) reduce the total number of vessels in excess of those needed to harvest the 2000 allowable catch;
(b) reduce fleet capacity by 50 percent in each sector at random;
(c) reduce fleet capacity by 50 percent in each sector while preserving fleet diversity; and
(d) select vessels to remain in the fleet that meet minimum ex-vessel revenue levels in each sector, respectively.

For each scenario, various proportions of vessels in excess of those “needed” according to capacity utilization estimates were eliminated. Landings, ex-vessel revenues, incomes and fleet composition were then compared to the 2000 base year. This provided a static picture of different fleet scenarios and what might happen in communities, but was not a predictive analysis showing the ripple effects of changes in the fleet. Figure 10 shows the results for the Northern Puget Sound ports. The alternatives also did not take into account the political and practical considerations of reducing the fleet. What they did was to provide a neutral point of reference for discussions about fleet reduction. The analysis showed that fleet capacity reduction would have varying effects among coastal communities, on fleet diversity and on distribution of income within the remaining fleet.

GFR estimated changes in the incomes of harvesters and processors using economic input–output models. Income impacts were estimated for harvesters and processors at each port and the models predicted the multiplier effect on each community. The community effects were then rolled-up into coastwide impact estimates. The project estimated the immediate effects but not the long-term adjustments that would be made by the fishers and communities to adjust to the fleet reduction.

---

The GFR recognized that the culture of fishing is also important to the social cohesion of coastal communities. “…A central aspect of the GFR project was the collection and integration of other socioeconomic data into the analysis. The ultimate goal is to develop a measure of community health and resilience in the face of changes in the fishery, potentially in a joint ecological-socioeconomic model we are exploring with academic partners. For the purposes of this project, however, we focused on identifying and integrating a variety of community-relevant data into the GFR framework. We approach this both through harvesting the fishery-dependent data in ways that we think are relevant for understanding how communities will make the transition and through a range of other data from sources like the United States Census Bureau.”65

In relation to fishery-dependent data, GFR used length as an indicator of vessel size and length along with gear types as a measure of fleet diversity. Preservation of fleet diversity was important to many people and organizations on the coast. The GFR added census and regional economic statistics from federal agencies on the community demographics such as educational attainment, county income and home ownership. This information could not yet be linked to directly to changes in the fishery. However, “…comparing data on, e.g. poverty, across different ports provides important context for considering fishery management measures. For example, reducing the fleet in a port with a higher rate of poverty or unemployment may have disproportionately larger effects than reducing the fleet in a well-diversified community.”66

The ultimate goal of the project, as it moves into its next phase, is to develop measures of community health and adaptability to change, such as an index of community resilience. Measures of location, demographics and economy such as commercial and marine infrastructure, distance from major cities or from other ports, or number and diversity of local businesses could be incorporated into one or more indices of community resilience to change. While there are currently no plans at the level of federal fishery managers (the PFMC) to monitor the impacts of management decisions on individual communities, the GFR serves as a baseline for various stakeholders, organizations and communities interested in conducting their own analysis and monitoring activities.

5. CONCLUSION

The three examples covered in this paper illustrate that indicators can be designed and used in a variety of ways and that many challenges accompany the use of indicators. The King County benchmarks illustrate how indicators can raise the consciousness of elected officials and influence policy decisions in unplanned ways. This feedback to policy is critical for continued support of the programme and for use of information in adaptive management. While Pierce County’s project also covered many important issues, lack of policy relevance eventually doomed the programme.

The Puget Sound shellfish monitoring programme shows how environmental information can have direct relevance to the health of an industry. Shellfish growers strongly support the programme and work closely with monitoring agencies and local governments to maintain and restore shellfish beds. Indicators should have advocates who can see the uses and benefits of data and lobby for necessary action.

Finally, the West Coast Groundfish Fleet Restructuring Project shows how local socio-economic indicators can be nested within a regional framework. The study also illustrates that indicators should address the culture of fishing as well as basic economic and social welfare.

REFERENCES


Growth Management Planning Council & Office of Management and Budget. 2002. *King County benchmarks, 2002 King County benchmark report.* The 7th annual report on progress in implementing the King County countywide planning policies. King County, Washington. (Available at http://www.metrokc.gov/budget/benchmrk/bench02)


Sustainable Community Roundtable. (Website http://www.olywa.net/roundtable/index.html)


Guidelines on the collection of demographic and socio-economic information on fishing communities.


1. INTRODUCTION

The region of Liguria is situated on the Tyrrhenian coast in Northern Italy. It has a north–south extension of 316 km, covers an area of 5 416 square km and a resident population of about 1 625 000 inhabitants in 1999.

The population is distributed over 235 municipalities, 43 of which are located on the coast. Roughly 80 percent of the entire population of Liguria live in these coastal municipalities. The coastal municipality of Genova is the most populous, accounting for about 48 percent of the total population of the region.

The main economic activities of Liguria region comprise industry, agriculture, shipping and tourism.

Industry includes the energy sector (oil, electricity) and the iron and steel, chemical, mechanics, electronics, manufacturing, construction, textiles and the forest and timber industries.

The agricultural activities carried out in the region include the growing of olives, flowers and vines. In addition to these activities, the Regional Rural Development Plan emphasizes agritourism, development of rural infrastructure, technical assistance and promotion and marketing of agricultural products.

The most important commercial ports are located in Savona, Genova and La Spezia. La Spezia also has a naval base.

Tourism has developed rapidly during the last few decades and is playing an increasingly important role in the Ligurian economy, particularly in the coastal area.

2. FISHERY AND AQUACULTURE

As elsewhere in the Mediterranean, the number of fishing vessels in Liguria increased considerably after the Second World War and fishing technologies and methods were modernized. However, its fishery infrastructure (i.e. fish markets, commercial networks, fish processing and preservation facilities) did not improve and develop much. Partly as a result of this situation, there has been only marginal improvement in the working conditions and living standards of fishers and fish workers.

The growth of the industrial and other sectors of the economy enabled these sectors to offer higher wages than coastal fishing. As a result, fishing as an occupation became less attractive and the sector began to stagnate. Environmental disasters such as that caused by the sinking of the oil tanker Haven, the collapse of fish sales in the 1980s as a result of the presence of high concentrations of mercury and the presence of a parasite in some commercial fish species, and declining catches caused by overfishing and pollution also contributed to the decline of the fishery industry in Liguria.

Other factors that impacted negatively on the fishing industry of Liguria include industrial development and tourism in coastal areas; the increase of residential areas and population pressure (which have contributed to the pollution of coastal waters); and the activities of “illegal” part-time fishers, who sell fish at lower prices than the professional fishers who are members of fishers cooperatives.

According to a 1994 census, the professional fishers in Liguria number about 3 000, representing approximately 3 percent of the total fisher population of Italy. In addition to those engaged in fishing,
another 2,000 persons are estimated to be involved in fish marketing, boat building and repair and other related activities.

The fishers of Liguria are relatively old with an average age ranging from 43 years in Savona Province to as many as 54 years in Genova Province. The high average age is another indicator of the declining role of coastal fishing in Liguria. Fishers are mostly organized in cooperatives, which also undertake the marketing of their products both locally and nationally.

According to the Osservatorio Ligure Pesca-Ambiente, 753 fishing boats were registered in Liguria in 1997, out of which 80 percent were less than 12 metres long. The type of fishing practiced along the coast of Liguria is characterized by the use of small motorboats; the use of a variety of mainly passive fishing methods including lines, pots, gillnets, etc. according to the environment and the season; involvement of a crew of 2–3 persons; one day/night fishing trips depending on weather conditions; and the targeting of high quality and value fish species. Fishing is largely carried out in an area between 3 and 6 miles from the shore, with most of the catch sold fresh and directly to local communities and tourists.

In addition to capture fisheries, aquaculture is practiced along the coast. Aquaculture in Liguria consists mainly of mussel culture, which is concentrated in the province of La Spezia. Three cooperatives are involved in mussel culture – one in hatchery activities and production of seed, another in mussel farming and purification, the third in marketing of mussels. The annual production of mussels is about 3,000 tonnes. In La Spezia, there is also a farm for the intensive culture of sea bass and sea bream.

Cage culture with floating cages has started recently in the municipality of Monterosso in the Cinque Terre area. Aquaculture is also being developed in the Province of Savona.

3. REGIONAL COASTAL PLANNING AND MANAGEMENT

There are several plans and instruments which play a role in coastal planning and management in the Liguria Region and which consider and impact on demographic and socio-economic characteristics of coastal and fisher populations.

The Liguria Regional Programme for Fishing and Aquaculture for the period 2000–2006 was elaborated by the Liguria Region after consultation with fishers organizations such as the Associazione Pescatori Liguri, the Lega Pesca, the Federcoopesca and the Osservatorio Ligure per la Pesca e Ambiente.

The programme is based on an assessment of the fishery and aquaculture sector in Liguria. The strengths of the sector are seen in the presence of local fishing communities with a long tradition and profound professional skills, in the strong cooperative organization of fishers, in the high quality and value of the targeted and captured fish species and in the strong market demand both for fresh fish and processed fish products. The main constraints and weaknesses of the sector are identified as the lack of adequately equipped fishing ports, the lack of sufficient cold storage infrastructure, deficient fish marketing arrangements and promotional activities, and old and inefficient fish and mussel culture facilities and installations.

The Regional Law of Liguria Number 23 for Fishing and Aquaculture of May 1996 and the Regional Law Number 30 of August 1997, which modifies and amends the previous law, provide a series of measures in support of fishing and aquaculture such as measures in support of sea safety, of navigational and communication equipment of fishing vessels, of improved fish cold storage and transport infrastructure and facilities, of fishery credit facilities as well as measures in support of conversion of fishing vessels for the purpose of ecotourism and sport fishing.

Priority interventions and measures foreseen by the Liguria Fishery and Aquaculture Programme for the period 2000–2006 are:

- Protection and rehabilitation of aquatic resources through the establishment of protected marine zones;
- Improvement of aquaculture practices;
- Construction and improvement of fishing ports;
- Processing and marketing of fish products;
- Financial incentives and technical assistance for coastal small-scale fishing communities and cooperatives;
- Improvement of safety and quality of fish products and promotion of fish consumption;
- Promotion of fisheries research and implementation of pilot projects in support of sustainable fisheries and aquaculture in Liguria.

Another important instrument of regional planning is the PTR or Piano Territoriale Regionale (Liguria Territorial Plan), as foreseen by the Liguria Regional
Guidelines on the collection of demographic and socio-economic information on fishing communities

Law Number 36/1997. It was approved in September 2002 as a so-called “preliminary document” (DGR number 963) and serves as a point of reference for the provincial and municipal territorial plans. It contains the objectives and sector specific goals and projects which the region wants to promote.

The Quadro Descrittivo (Descriptive Part) of the PTR analyses and makes proposals regarding the following themes:
- major towns and their problems
- coastal tourist centres
- rural space
- infrastructure
- tourism.

The instruments for the execution of the territorial plan at subregional and local level are:
(a) the Patto Territoriale (Territorial Agreement), which can be promoted by local public administrations and by people’s organizations for integrated interventions concerning industry, agro-industry, services, tourism and infrastructure;
(b) the Contratto d’Area (Local Area Agreement), which can be promoted by local administrations and workers and business organizations in order to propose new economic activities for the increase of job opportunities in industry, agro-industry, services and tourism.

Another important instrument of coastal resource management is the PTCP or Piano Territoriale di Coordinamento Paesistico (Territorial Plan for Environmental Coordination), which aims to protect the quality of landscape and environment, to protect accessibility to public spaces such as beaches and coastal areas and to protect non-renewable resources such as water sources, beaches, minerals, plains, forests etc.

The Piano della Costal (Coastal Plan) identifies the main sectors/projects of regional interest such as the protection of coasts and beaches through the prevention of beach erosion, the improvement of ports serving tourists, the conversion of abandoned coastal railway tracks to cycling roads/pedestrian paths and the improvement of public transport and the coastal road/transport system in an environmentally friendly manner.

Finally, there is the PTC or Piano Insediamenti Produttivi (Plan for Economic Development) for the central part of Liguria. This plan (DCR number 95/1992 and DPGR number 44/2000) refers particularly to the industrial area of Genova Province and the eastern part of Savona Province, encompassing a total area of 2 600 square km. This area represents 48 percent of the total Liguria region and accounts for 74 percent of the population of Liguria. About 60 percent of the total population and 75 percent of the labour force of the entire region are concentrated in the urban area alone of Genova Province, which has an average population density of 14 000 inhabitants per square km.

The major industrial activities of the area include shipping, metal work and the production of chemicals, charcoal and oil.

The objectives of the PTC are to increase the competitiveness of industry and to stimulate innovation, to improve the urban environment and infrastructure and to improve the transport and communications system.

4. USE OF DEMOGRAPHIC AND SOCIO-ECONOMIC INDICATORS IN REGIONAL COASTAL PLANNING AND MANAGEMENT

The main demographic and socio-economic indicators used for the formulation of the Piano Regionale Territoriale (Regional Territorial Plan) of Liguria Region are specified in the chapter on geography and include:
- Population density in terms of number of inhabitants per square km, 1991;
- Rate of natural population increase/decrease (= crude birth rate-crude death rate) expressed as a percentage of the population, 1990–1999;
- Rate of migratory population increase/decrease (= in-migration into a municipality minus out-migration empirically measured as the difference between registrations and cancellations at the registry office of a municipality) expressed as a percentage of the population, 1990–1999;
- Demographic balance (combination of natural and migratory population increase/decrease), 1971–1991;
- Variation in the number of residents for the period 1991–1999;
- Municipalities by number/class of residents (over 800 000, 500 000–800 000, ..., 1 000–5 000, 0–1 000), 1861–1936;
- Municipalities by class of residents, 1971–1991;
- Hotels and restaurants, in terms of number of units and number of workers (increase/decrease), 1990–1996;
- Manufacturing and commercial enterprises, in terms of number of units and workers (increase/decrease), 1990–1996;
• Total economic enterprises, in terms of number of units and of workers (increase/decrease), 1990–1996;
• Education and health services by province as of June 2001.

Annual statistical data provided by the Liguria Regional Statistical Office provides information to economic, social and cultural enterprises and organizations as well as to the public administration for their programme and planning interventions and for the evaluation of the effects of these interventions.

The most important topics and related indicators used in regional and coastal planning and management are the following:

1. Population

- Demographic (= natural and migratory) balance of resident population, 1991–2000
- Resident population by sex and class of age (1 year, 2 years, 3 years, 4 years, 5 years, …)
- Resident population by sex and class of age (0–5 years, 6–10 years, 11–15 years, …)
- Resident population by sex and class of age (0–14 years, 15–64 years, 65 years and over)
- Change of residence and resident population by sex and municipality
- Migratory movement of resident population by provenance and destination, by sex and municipality
- Foreign resident citizens by geographical area of citizenship and province as of 1 January 2001
- Foreign resident population by provenance and sex as of 1 January 2001
- Marriages by rite (civil, religious) and province
- Major population indicators by province:
  - Demographic indicators: birth rate, mortality, average number of children of women in fertile age, life-expectation at birth (males, females)
  - Population structure index: old age index, average age.

2. Environment and Territory

- Municipalities, territorial surface, resident population and density, per province, year 2000
- Territorial surface (in hectares) and altitude of municipalities
- Rainfall: quantity (in millimetres) and number of rainy days in selected weather stations
- Monthly rainfall (in millimetres) in selected weather stations, year 2001
- Number of rainy days per month in some weather stations, year 2001
- Condition/quality of coastal waters (coastal length in kilometres) by province Total length of coastline
- Coastline where bathing is prohibited, either permanently or temporarily because of pollution or other reasons
- Coastline where bathing is allowed
- Protected natural areas (in hectares) as on 31 July 2002 by province
- Environment monitoring stations of provincial network and ENEL by typology and province
- Concentration of sulfate bioxide recorded by some monitoring stations
- Forest fires (surface in hectares) and related damage by province in year 2000
- Forest fires by cause and province in year 2000
- Urban waste collection in tonnes by province
- Diversified and selective waste collection by province
- Number of vehicles (from the public registry) by category and province

3. Health

- Number of hospital beds, number of hospitalized persons and number of days of hospitalization, by hospital
- Staff serving in the regional health system by local health service and hospital
- Ambulance services and access to and use of the first aid service
- Doctors and medical expense by local health service
- Drug addicts and therapeutic groups by local health service
- Assistance to elderly people, number of assisted persons, days of hospitalization and number of hospital beds
- Day care centres, residential facilities by local health service
- Home care services
Assistance to psychiatric patients by local health service
Assistance to disabled persons and available services (ambulatory, home assistance and day centres)
Causes of death, by age of resident population and sex

4. Education
- Kindergarten: institutions, number of classes, number of children
- Primary schools: schools, number of classes, number of students
- Middle schools: schools, number of classes, number of students
- Secondary schools: institutes, number of classes, number of students
- University: courses and number of students
- Vocational education: courses and number of students

5. Employment
- Population 15 years old and over by employment status (employed, unemployed), sex and province
- Population and labour force by age and sex
- Number of employed by age and sex
- Number of employed by dependency status (dependent, independent), economic sector, sex and province
- Number of employed by full-time/part-time employment, sex and economic sector
- Percentage of employment with work related accidents and professional diseases by province
- Number of pensions by age and employment category

6. Agriculture
- Number of farms, total farm area (in hectares) by category of farming and province
- Number of farms with animal husbandry by total surface and province
- Number of cattle by animal category, total surface and province
- Average area of farms by type of farm, farm area and province
- Number of the family farm workers and hired farm workers
- Number of farms using mechanization by type of ownership

7. Industry
- Change of location of industrial and construction companies by sector of activity and province
- Consumption of electricity by sector of economy and by province

8. Commerce
- Number of retail shops and their distribution
- Number of supermarkets and their distribution

9. Tourism
- Number of hotels by category and province
- Arrivals, presence and average occupancy of hotels by Italian and foreign tourists, by province
- Presence of foreign tourists in hotels by country of origin and province

10. Transport
- Road network by kind of road
- Railway network
- Commercial maritime traffic
- Number of motorboats by category and length

11. Credit
- Bank network and their branch network
- Distribution of bank deposits by locality and economic activity of customer (public administration, companies and private households)

5. AN EXAMPLE FOR LOCAL COASTAL PLANNING: THE MUNICIPALITY OF VERNAZZA

Nature reserves, parks and protected areas also form part of the Liguria Region planning activities. Among them is the Cinque Terre National Park, established under the chapter on rural space of the Regional Territorial Plan. The rehabilitation and management of some rural buildings and the maintenance of the traditional wine terraces at risk of soil erosion due to a discontinuation of wine growing activities are among the other interesting initiatives taken by the Plan in recent years.

At local level, an interesting example for participatory planning is the Piano di Azione Locale (Local Action Plan) approved in June 2002
by the Municipality of Vernazza, which forms part of the Cinque Terre area. The Local Action Plan was developed and is being implemented jointly with the Liguria Region and the technical assistance of the so-called Laboratorio Mediterraneo per un Turismo Sostenibile (Mediterranean Centre for Sustainable Tourism) of the Centro V.I.A. Italia, a consortium promoted by the European Commission in agreement with the Italian Ministry of Environment for the diffusion of the evaluation of environmental impact.

The objective of the Local Action Plan is to promote self-sustainable development of the municipality of Vernazza. This is to be achieved by making the citizens of Vernazza more aware of the problems surrounding sustainable development in the municipality; by encouraging the local population to participate in the process of tackling the environmental problems of the area; and by elaborating together with the local population commonly agreed objectives, action plans and programmes for the improvement of the socio-economic conditions and well-being of the local community.

With a view to elaborating commonly agreed objectives, action plans and programmes, a committee composed of representatives of the municipality, the technical staff and the civil service promoted a series of discussions involving the local population on topics such as:
- Environment, tourism, transport, health services, local culture, land use and construction rules and activities;
- Local values and traditions, agriculture, landscapes, the sea;
- Natural resources, energy, water, impact of waste from industrial activity and human settlement on the environment.

5.1 Key indicators
During these discussions, the following key indicators to be used for coastal regional planning and management were identified:
- geographic, geological and landscape aspects
- natural environment and biodiversity
- air quality and climate
- water bodies and rivers
- water and energy resources
- urban environment
- demographic and social aspects
- economic activities
- waste disposal.

5.2 Demographic and social problems
Among the most important demographic and social concerns of the municipality of Vernazza, as identified by the Rapporto sullo stato dell’ambiente 2000 (Report on the State of the Environment 2000), are the decline and rapid aging of the population in the municipality.

By 1999, the population of the municipality of Vernazza had declined to only 1117 inhabitants.

Table 1 shows the high percentage of older people in the municipality of Vernazza as compared to other municipalities, the province of La Spezia and the region of Liguria.

The decline and aging of the population is also expressed by three demographic indicators – the aging index, the old age index and the dependency rate, which are shown in Table 2.

The aging index reflects the ratio of old people (65 years and over) to the total population. The old age index reflects the ratio of old people (65 years and over) to young people (0–14 years).

Table 2 shows that for both these indices, the

TABLE 1
Age composition of the population of Vernazza and other "Cinque terre" municipalities (in 1999) as compared to the age composition of the population of the Region of Liguria

<table>
<thead>
<tr>
<th>AGE OF POPULATION (YEARS)</th>
<th>0–14</th>
<th>15–29</th>
<th>30–44</th>
<th>45–59</th>
<th>60–74</th>
<th>75+</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Municipality of Vernazza</td>
<td>9%</td>
<td>12%</td>
<td>21%</td>
<td>19%</td>
<td>24%</td>
<td>15%</td>
<td>100%</td>
</tr>
<tr>
<td>Municipality of Riomaggiore</td>
<td>6%</td>
<td>14%</td>
<td>18%</td>
<td>21%</td>
<td>24%</td>
<td>15%</td>
<td>100%</td>
</tr>
<tr>
<td>Municipality of Monterosso</td>
<td>10%</td>
<td>16%</td>
<td>20%</td>
<td>19%</td>
<td>22%</td>
<td>13%</td>
<td>100%</td>
</tr>
<tr>
<td>Province of La Spezia</td>
<td>10%</td>
<td>16%</td>
<td>22%</td>
<td>20%</td>
<td>20%</td>
<td>12%</td>
<td>100%</td>
</tr>
<tr>
<td>Region of Liguria</td>
<td>10%</td>
<td>16%</td>
<td>22%</td>
<td>20%</td>
<td>20%</td>
<td>11%</td>
<td>100%</td>
</tr>
</tbody>
</table>
The dependency rate reflects the ratio of the typically non-economically active age groups of 0–14 years and 65 years and over to the presumed economically active population. Again, the figure for Vernazza is higher than for the province and the region as a whole.

Other major problems with which regional coastal planning and management in the municipality of Vernazza has to deal are:

• unemployment problems reflected by a high percentage of people (26 percent) who must seek work outside the Cinque Terre sub-region;
• environmental problems created by a massive seasonal presence of tourists, particularly from April to October;
• transport and parking problems;
• marginalization of agricultural and fishing activities, the abandonment of traditional wine terraces and declining demand for traditional local products;
• insufficient medical assistance;
• lack of home care services for elderly and disabled people.

### 5.3 Activities proposed to improve the situation

As a result, a so-called calendar of activities was elaborated for the period 2002–2003 and 2004–2005 indicating the action proposed and the promoters and parties responsible for a particular activity.

The priority activities proposed are:

• promotion/establishment of ecotourism information centres;
• promotion of environmental information campaigns for tourists;
• improvement of the local railway transport system;
• creation of local market places outside of urban centres;
• use of helicopters for medical emergency services in remote coastal areas;
• provision of home care assistance to aged and disabled persons;
• promotion of trade fares for typical local products;
• public construction of new residential flats for residents, respecting local architectural styles;
• provision of facilities and tax rebates to those renting flats to resident young couples with the objective of reversing the present demographic trend towards an aging population;
• promotion/organization of training courses for new cultivation techniques, bio-agriculture and wine growing;
• creation of an “Environment Fund” partly sustained by tourist business-related commercial income;
• elaboration of stricter maritime traffic regulations;
• tightening of rules for entry of motor vessels into small ports;
• better control of wastewater disposal of coastal towns;
• promotion of biological compost production, collection of vegetal oils and introduction of selective waste collection;
• promotion of energy and water saving.

The major difficulties encountered when implementing the above activities are the rather limited human and financial resources available for
the implementation of the Local Action Plan: The municipality of Vernazza is very small and its revenue, because of the problems described above, is very limited.

For this reason, the overall management of the Local Action Plan of Vernazza is now entrusted to the recently established Cinque Terre National Park, which was formed in the context of the implementation of “Agenda 21” with considerable financial support from the Ministry of Environment of the Italian Government. Similar local action plans are now being evolved for other municipalities in the Cinque Terre.

Most of the activities foreseen in the 2002–2003 calendar are being implemented but have not been yet evaluated.
Guidelines on the collection of demographic and socio-economic information on fishing communities for use in coastal and aquatic resources management

These guidelines specify key indicators for the identification of demographic issues in coastal area management and for monitoring the impact of management measures on the socio-economic well-being of coastal and fishing communities. The guidelines also identify data sources and methods for the collection of data. Case studies on the use of demographic data in coastal area management in Italy and the United States of America and a summary of the proceedings of a regional workshop on the use of demographic data in coastal area management in the Philippines and other Southeast and South Asian countries provide practical examples of how demographic indicators are used.