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*Coastal Area Management Program  
International Center for Living  
Aquatic Resources Management  
Manila, Philippines*





# RATIONALE

Coastal areas play a critical role in the economic and social development of tropical countries. The highly productive ecosystems found in these areas support a wide range of economic activities. Increasing populations and economic and social development place heavy demands on coastal resources, and often result in natural resource depletion, environmental degradation and conflicts over the use of these valuable resources. Coastal resources problems which stem largely from overexploitation are due mainly to poor planning and management of resource use and allocation. Human use of natural resources in coastal areas must be effectively managed and environmentally sustainable if present and future opportunities for socioeconomic development are to be assured.

The problems currently affecting coastal areas could be compounded by the global climate changes which are anticipated to occur over the next century as a result of the *greenhouse effect*. Projected changes include increases in temperature, rainfall, storm frequency and drought as well as accelerated sea level rise.

Fig. 1. Poor planning and management of resource use and allocation result in overexploitation of resources and environmental degradation.

Cover: Phangnga Bay, Thailand. (Photo by Chua Thia-Eng.)





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COASTAL RESOURCES MANAGEMENT

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Consequences of failure to address coastal resources management issues are likely to include:

- Disruption and/or damage to coastal-based ecological systems;
- Diminution of goods and services provided by coastal resources;
- Destabilization of coastal economies; and
- Social dislocations.

Thus, it is imperative to address coastal resources management issues immediately.

Difficulties experienced to date by national and international initiatives to address coastal resources management issues can be attributed to a number of factors, including:

- Inadequate support from political leadership and community;
- Inadequate knowledge and understanding of the ecological and economic relationships among resource systems;
- Inability to quantify economic losses due to environmental degradation or resource depletion;
- Inability to resolve multiple resource-use conflicts;
- Lack of public awareness and community participation; and
- Inadequacy of policies on resources allocation due to lack of consideration of the environmental consequences.

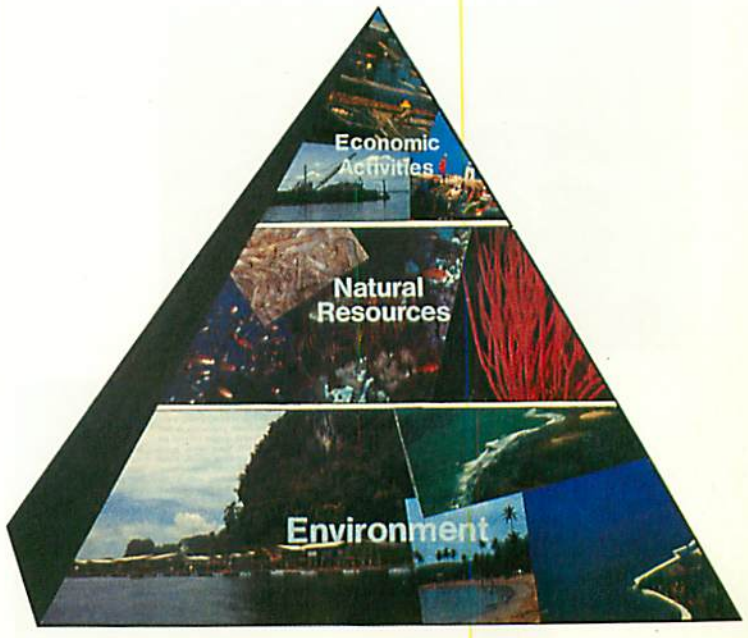


Fig. 2. The environment is the base of natural resources which supports diversified economic activities.

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# COASTAL AREA MANAGEMENT PROGRAM



Fig. 3. Mangroves, coral reefs and seagrasses comprise productive coastal ecosystems in the tropics that must be conserved and managed on a sustainable basis. (Photos by Chua Thia-Eng and Alan T. White.)

In late 1988, the International Center for Living Aquatic Resources Management (ICLARM) established the Coastal Area Management Program (CAMP) in response to the growing concerns over the environmental consequences of economic and social development within coastal areas. The program is an outgrowth of the Association of Southeast Asian Nations (ASEAN)/United States (US) Coastal Resources Management Project which has been implemented by ICLARM since 1986.

## Goal

The focus of the program is the promotion of the adoption of integrated coastal area management in tropical developing countries worldwide. The goal is to provide sound socio-economic justification for the conservation of critical habitats and the pursuit of long-term and sustainable productivity of coastal fisheries, forestry and other forms of environmentally compatible uses of coastal resources. Opportunities for appropriate public and private sector activities in the coastal area are promoted while unsustainable forms of development are discouraged, through appropriate management strategies.

## Scope

The program works closely with national and international institutions in tropical developing countries in Asia and is beginning activities in Africa and Latin America. There are three essential elements in the program: research, training and information dissemination.



## Objectives

- Increase awareness among policymakers in tropical developing countries of issues related to coastal resource depletion, environmental degradation, and on the importance of sound coastal area management policies;
- Develop an appropriate ecological-socio-economic basis for the formulation of coastal area management policies and strategies in developing nations;
- Improve capabilities for assessment and evaluation of the capacity of coastal resource systems to sustain intensive and multiple-use forms of development;
- Establish cooperative applied research on relevant management issues in coastal zones;
- Strengthen technical and management capabilities of developing nations in coastal area management; and
- Disseminate technical and educational information for researchers, educators, coastal zone users and the general public.



Fig. 5. Singapore, an example of coastal urbanization and intense ocean space use.

## Beneficiaries

The program's outputs will directly benefit the national governments of participating countries through strengthening and improvement of the technical and management capabilities of national institutions that deal with coastal zone issues. Increased management capabilities within these institutions should lead to management of coastal resources and, ultimately sustainable increases in the well-being of coastal communities.

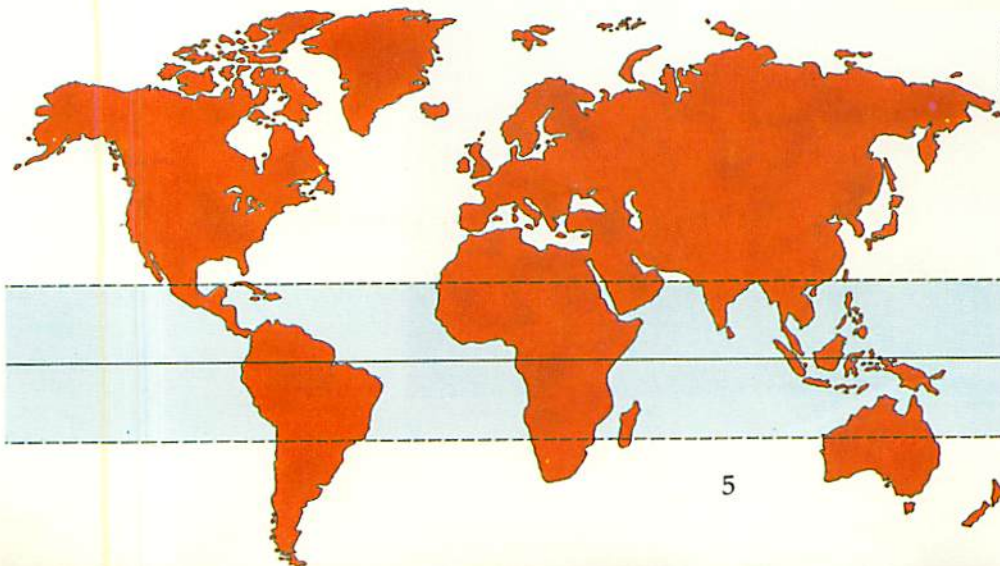


Fig. 4. Coastal Area Management Program activities cover developing countries in the tropics (shaded).



# RESEARCH

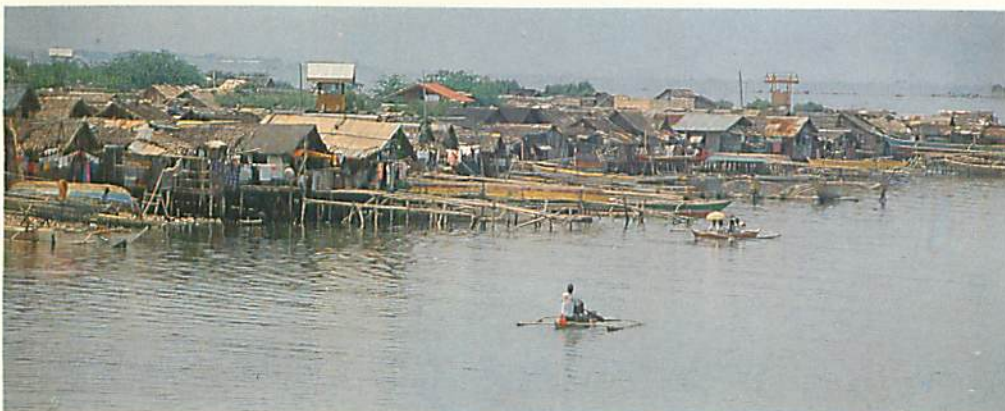
The program's scope includes research in collaboration with private, national and international institutions in the following areas:

- Resource assessment and inventory;
- Analysis of critical relationships between population, resources, the environment and economic systems
  - Ecological-socioeconomic modelling
  - Identification of critical ecological links between resource systems
- Identification of multiple resource-use conflicts and strategies for resolution
  - Case studies
- Valuation of natural resources
- Socioeconomic analysis of coastal communities
- Resource allocation and national accounting
  - Traditional practices and management
  - Role of women
  - Socioeconomic impacts of resource depletion and environmental degradation



Fig. 6. Netcage farming uses coastal water space, Penang, Malaysia. (Photo by Chua Thia-Eng.)

Fig. 7. A coastal fishing village, Manila Bay, Philippines. (Photo by James N. Paw.)



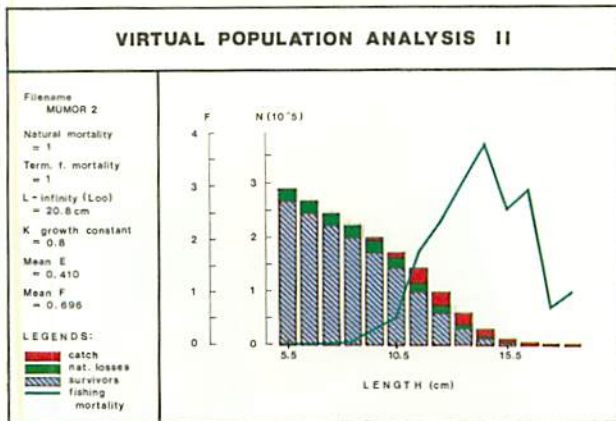
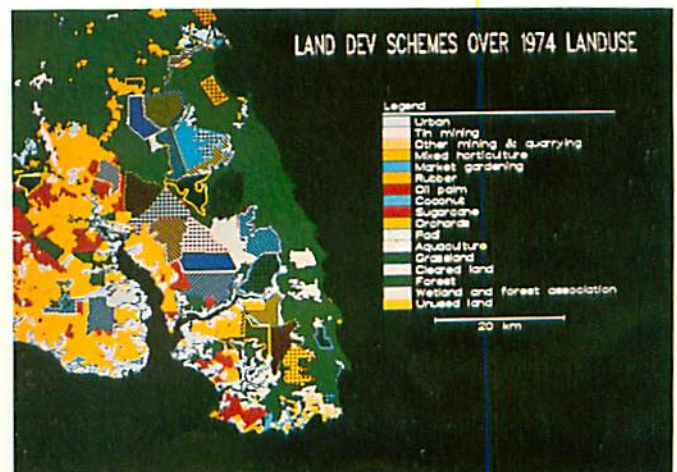


Fig. 8. (Top) A Landsat imagery of the Lingayen Gulf, Philippines. (Photo courtesy of Ricardo T. Biña.)

Fig. 9. (Bottom) Virtual population analysis of the goatfish, *Upeneus moluccensis*, from Ragay Gulf, Philippines.

Fig. 10. (Right) The output of a Geographic Information System showing the major land development schemes in Johore, Malaysia. (Photo by Kam Suan Pheng.)

- Legal and institutional framework
- Management considerations
  - Economic incentives and disincentives
  - Common property management
  - Environmental management
  - Renewable resources management and conservation
  - Waste management
- Planning tools and resource assessment methodologies
  - Remote sensing/Geographic Information Systems (GIS)
  - Planning and analysis
  - Environmental Impact Assessment (EIA)
- Habitat enhancement and rehabilitation
  - Methodology development and impact assessment
- Global climate changes
  - Policy orientation and government development program restructuring





# EDUCATION, TRAINING AND INFORMATION

The program offers nondegree, short-term training courses in close collaboration with national and international institutions on various aspects of coastal area management and assists universities in curriculum development. The program disseminates information through publications, public awareness activities, workshops and conferences.

- Short-term courses in techniques and methodology
  - Remote sensing and GIS applications
  - Economic evaluation of natural resources
  - Planning and management
  - EIA
  - Ecological-socioeconomic modelling
- Specialized training
  - Marine parks and reserves management
  - Water quality management
  - Coastal fisheries resources management
  - Red tide monitoring and response
  - Solid waste management
  - Island management



Fig. 11. The Coastal Area Management Program conducts various short-term trainings to develop technical manpower capabilities of cooperating institutions. (Photo by James N. Paw.)



- Curriculum development
- Educational materials development
  - Training manuals
  - Educational booklets
  - Technical publications
  - Posters/comics
- Newsletters
- Videos
- Workshops/conferences



# CURRENT PROJECTS

## ASEAN/US Coastal Resources Management Project (CRMP)

A six-year (1986-1991) project funded by the US Agency for International Development (USAID), the CRMP aims to increase existing capabilities within ASEAN region to develop and implement comprehensive, multidisciplinary and environmentally sustainable coastal resources management strategies through research, training and information dissemination activities.

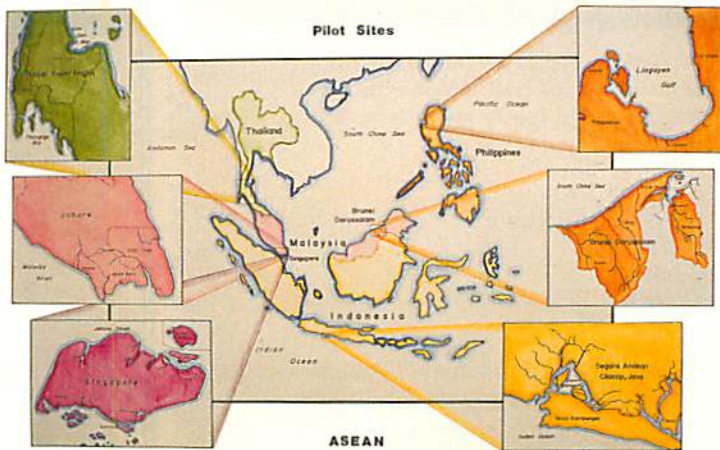


Fig. 12. Six pilot sites in the ASEAN region chosen for the development of integrated coastal resources management plans.



## Coordinating/implementing agencies

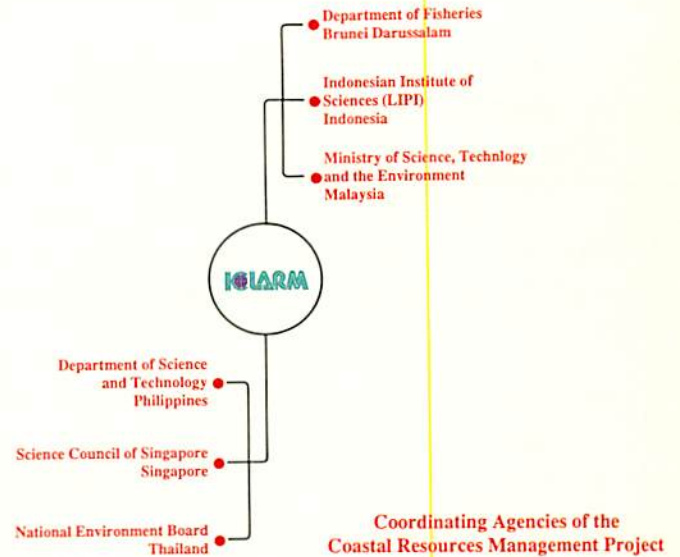
The project collaborates with 47 national institutions and over 200 scientists and resource managers in the region.

## Project components

Development of site-specific coastal resources management plans in the six member-countries of the ASEAN. This component includes resource assessment, cooperative research and planning activities.

Manpower development and information dissemination on coastal resources management through short-term and academic (masters) degree training, workshops and publication of newsletter, educational materials and technical reports.

Fig. 13. A regional technical workshop.





## Asian Fisheries Social Science Research Network (AFSSRN)

The AFSSRN was established in 1983. It consists of a network of 10 research teams at universities and government agencies. Each institution has made a commitment to the development of social science research and education on fisheries. This network is financially supported by the International Development Research Centre of Canada and the Ford Foundation. A panel of socioeconomic experts advises on research projects of the network.

### Research categories and projects

#### *Marine fisheries management*

The management of small pelagic fisheries of Guimaras Strait and vicinity, Philippines

The management of the large and small seine fisheries of the North Java Coast in the Java Sea, Indonesia

The management of the small pelagic fisheries of the East Coast of Peninsular Malaysia

#### *Farming systems*

The management of aquaculture enterprises and systems in South Sulawesi and the North Coast of Java, Indonesia

The simulation of operations of small shrimp farms, Malaysia

#### *Aquaculture management*

Evaluation of the impact of shrimp farming on coastal resource systems, Philippines

The management of integrated fish farming operations in Central Thailand

The management of integrated fish farming operations in West and Central Java, Indonesia



Fig. 14. Women play a significant role in the marketing and post-harvest management of fish and fishery products in the Philippines.

### Member institutions

#### *Indonesia*

Universitas Diponegoro  
Faculty of Economics

Agency for Agricultural Research and Development  
Research Coordinating Center for Fisheries

Agro-Ecosystems Research Group

#### *Malaysia*

Universiti Pertanian Malaysia  
Faculty of Economics and Management

#### *Philippines*

University of the Philippines in the Visayas  
College of Arts and Sciences  
College of Fisheries, Social Science Division

University of the Philippines at Los Baños  
College of Development Economics and Management

Bureau of Fisheries and Aquatic Resources  
Aquaculture Division

#### *Thailand*

Kasetsart University  
Faculty of Economics and Business Administration

Department of Fisheries  
Fisheries Policy and Planning Division

Prince of Songkla University  
Faculty of Natural Resources



## Training and education

The network conducts short-term training in management and research methods relating to capture fisheries, aquafarming systems and aquaculture economics. It also publishes a newsletter which focuses on the network activities and on methodologies, and presents a forum for interaction among network members. The network facilitates application of its members to apply for masteral or doctoral studies.



Fig. 15. A coastal dreamland: managed coastal area where resource-use conflicts and environmental degradation have been minimized.

### For inquiries:

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#### **International Center for Living Aquatic Resources Management**

The International Center for Living Aquatic Resources Management (ICLARM) is an autonomous, nonprofit, international scientific and technical center which has been organized to conduct, stimulate and accelerate research on all aspects of fisheries and other living aquatic resources.

The Center was incorporated in Manila on 20 January 1977 and its operational base was established in Manila in March 1977. The interests of ICLARM are primarily in tropical, developing countries worldwide.

ICLARM is an operational organization, not a granting or funding entity. Its program of work is aimed to resolve critical technical and socioeconomic constraints to increased production, improved resource management and equitable distribution of benefits in economically developing countries. It pursues these objectives in the fields of aquaculture, resource assessment and management, education and training and information through cooperative research with institutions in third-world and developed countries.

The ICLARM core staff consists of internationally recruited scientists drawn from diverse disciplines in the biological and social sciences. In addition, provision is made for trainees, consultants and visiting scientists, contributing to breadth of competence and flexibility.

The core program and core staff are supported by private foundations and governments.