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Managing ASEAN's Coastal Resources for Sustainable Development:

Roles of Policymakers, Scientists, Donors, Media and Communities

Edited by Chua Thia-Eng and Louise Fallon Scura

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Manila and Baguio, Philippines
4-7 March 1990

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ICLARM



**Association of Southeast Asian Nations/United States
Coastal Resources Management Project
Conference Proceedings 6**

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Preface

The coastal waters of Southeast Asian countries have some of the world's richest ecosystems characterized by extensive coral reefs and dense mangrove forests. Blessed with warm tropical climate and high rainfall, these waters are further enriched with nutrients from the land which enable them to support a wide diversity of marine life. Because economic benefits could be derived from them, the coastal zones in these countries teem with human settlements. Over 70% of the population in the region lives in coastal areas where resources have been heavily exploited. This situation became apparent between the 1960s and 1970s when socioeconomic pressures increased. Large-scale destruction of the region's valuable resources has caused serious degradation of the environment, thus affecting the economic life of the coastal inhabitants. This lamentable situation is mainly the result of ineffective or poor management of the coastal resources.

Coastal resources are valuable assets that should be utilized on a sustainable basis. Unisectoral overuse of some resources has caused grave problems. Indiscriminate logging and mining in upland areas might have brought large economic benefits to companies undertaking these activities and, to a certain extent, increased government revenues, but could prove detrimental to lowland activities such as fisheries, aquaculture and coastal-tourism dependent industries. Similarly, unregulated fishing effort and the use of destructive fishing methods, such as mechanized push-nets and dynamiting, have seriously destroyed fish habitats and reduced fish stocks. Indiscriminate cutting of mangroves for aquaculture, fuel wood, timber and the like has brought temporary gains in fish production, fuel wood and timber supply but losses in nursery areas of commercially important fish and shrimp, coastal erosion and land accretion.

The coastal zones of most nations in the Association of Southeast Asian Nations (ASEAN) are subjected to increasing population and economic pressures manifested by a variety of coastal activities, notably, fishing, coastal aquaculture, waste disposal, salt-making, tin mining, oil drilling, tanker traffic, construction and industrialization. This situation is aggravated by the expanding economic activities attempting to uplift the standard of living of coastal people, the majority of whom live below the official poverty line.

Some ASEAN nations have formulated regulatory measures for their coastal resources management (CRM) such as the issuance of permits for fishing, logging, mangrove harvesting, etc. However, most of these measures have not

proven effective due partly to enforcement failure and largely to lack of support for the communities concerned.

Experiences in CRM in developed nations suggest the need for an integrated, interdisciplinary and multisectoral approach in developing management plans that will provide a course of action usable for the daily management of the coastal areas.

The ASEAN/United States (US) Coastal Resources Management Project (CRMP) arose from the existing CRM problems. Its goal is to increase existing capabilities within ASEAN nations for developing and implementing CRM strategies. The project, which is funded by the US Agency for International Development (USAID) and executed by the International Center for Living Aquatic Resources Management (ICLARM) in cooperation with ASEAN institutions, attempts to attain its goals through these activities:

- analyzing, documenting and disseminating information on trends in coastal resources development;
- increasing awareness of the importance of CRM policies and identifying, and where possible, strengthening existing management capabilities;
- providing technical solutions to coastal resources use conflicts; and
- promoting institutional arrangements that bring multisectoral planning to coastal resources development.

In addition to implementing training and information dissemination programs, CRMP also attempts to develop site-specific CRM plans to formulate integrated strategies that could be implemented in the prevailing conditions in each nation.

To date, these management plans have essentially reached the final phase of completion and require approval, endorsement and funding for implementation. The Policy Conference on Managing ASEAN's Coastal Resources for Sustainable Development, held in Manila and Baguio City, Philippines, on 4-7 March 1990, endeavored to pool the insights and experiences gleaned in the process of developing the plans and to establish the groundwork for plan implementation.

The prime objective and significance of this conference are reflected in the keynote speeches delivered by then Philippine Executive Secretary Catalino Macaraig and Thailand's then Deputy Prime Minister Chuan Leekpai. Secretary Macaraig emphasized the close interrelationship between judicious management of the natural resources base and its sustainable development. At the opening of the technical sessions, Deputy Prime Minister Leekpai underscored the value of coastal resources to ASEAN economic development and called for the drafting of a policy resolution.

Formal presentations and discussions were conducted in four sessions. The first session concentrated on the current status and accomplishments of coastal resources planning and management, while the other three highlighted the respective roles of political leaders; donors and national governments; and the media, nongovernmental organizations (NGOs) and coastal communities in putting the plans to work.

Recognition of the root causes of the problems inherent in coastal areas coupled with the urgency of implementing effective solutions was the recurrent theme of the discussions.

The culmination of the conference witnessed the participants' unanimous and unequivocal agreement to an integrated management of coastal areas as embodied in its policy resolution. Called the "Baguio Resolution on Coastal Resources Management," the document is a tangible proof and a potent statement of the collective concern for the endangered condition of the ASEAN coastal environment, and furnishes the rationale and recommendations for the management, protection and rehabilitation of its coastal resources. This unprecedented multinational resolution carries on the ASEAN tradition of commitment to resolve crucial issues through international collaboration.

The conference was made possible through the co-sponsorship of the Government of the Republic of the Philippines, the Philippine Departments of Science and Technology, Agriculture, Environment and Natural Resources, and Tourism; the National Economic Development Authority; the Provincial Governments of Pangasinan and La Union; and the ASEAN/US CRMP. The participation of high-ranking government officials from each ASEAN country; scientific and technical experts from Asia, Europe and North America; and representatives of the media, NGOs and international donor agencies is gratefully acknowledged. ICLARM professional and support staff served as the conference secretariat and/or provided valuable support in the production process. Ms. Marie Sol M. Sadorra and Ms. Rachel D. Africa assisted in the editing job; Ms. Rachel C. Josue typed the manuscript; and Ms. Rachel Atanacio prepared the figures and the layout. The authors and editors express their appreciation to those who helped in one way or another in the publication of this book.

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Opening Ceremonies

ASEAN's Efforts in Managing Coastal Resources for Sustainable Development*

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SOEGIARTO, A. 1991. ASEAN's efforts in managing coastal resources for sustainable development, p. 1-4. In T.-E. Chua and L.F. Scura (eds.) *Managing ASEAN's coastal resources for sustainable development: roles of policymakers, scientists, donors, media and communities*. ICLARM Conference Proceedings 30, 125 p. Department of Science and Technology; Department of Agriculture; Department of Environment and Natural Resources; and Department of Tourism, Philippines; and International Center for Living Aquatic Resources Management, Philippines.

Abstract

Against the backdrop of the complex problems in the coastal areas caused by increasing population and economic pressures, the significant collaborative efforts among ASEAN, and multilateral and bilateral international organizations and donor agencies are highlighted. The United Nations Environment Programme (UNEP) and the International Union for the Conservation of Nature and Natural Resources (IUCN) have established detailed programs to improve measures towards the protection, conservation and management of the coastal habitats and wildlife. ASEAN's own efforts towards sustainable development are also described, with special reference to the activities of the ASEAN/US Coastal Resources Management Project (CRMP).

*Welcome Address delivered during the Opening Ceremonies of the ASEAN/US CRMP Policy Conference on Managing ASEAN's Coastal Resources for Sustainable Development on 4 March 1990 at the Manila Hotel, Manila, Philippines.

It is indeed an honor and a privilege for me to deliver an address to a distinguished gathering such as this. May I, on behalf of the ASEAN Subcommittee on Marine Sciences and of the Organizing Committee, welcome you all and express sincere gratitude for your presence in these Opening Ceremonies of the "Policy Conference on Managing ASEAN's Coastal Resources for Sustainable Development," despite your heavy schedule and also on a Sunday afternoon. Tomorrow morning, this conference will move to Baguio, a beautiful city in the mountain. I sincerely hope that the more pleasant climate, and the quieter and more beautiful surroundings of Baguio City will be more conducive to the achievement of conference objectives.

The theme of the conference is very appropriate and timely. The principle of sustainable development has been endorsed fully by the Third Summit Meeting of the ASEAN Heads of Government in Manila in December 1987. The Manila Declaration of 1987 states that, "ASEAN shall cooperate in promoting the principle of sustainable development and systematically integrating it into all aspects of development and shall focus on the need for policy guidelines to protect ASEAN's common resources and environment."

The marine and coastal region of Southeast Asia is probably one of the world's most productive areas. Blessed with a warm, humid, tropical climate and high rainfall, the region allows coral reefs and mangrove ecosystems to flourish along the coastline. Due to the economic benefits that could be derived from these rich and diverse ecosystems, the coastal zones of Southeast Asia are densely populated. Over 70% of the population in the region lives in the coastal areas, resulting in a high level of exploitation of the natural resources. Population pressures associated with several economic activities have caused large-scale destruction and serious degradation of the coastal and marine environment. Increasing pollution, both land- as well as marine-based, in the last decade has compounded the problems.

Human existence depends on a stable and sustainable natural resource base. The marine and coastal environment in Southeast Asia harbors such a resource base. Overuse of marine resources has implications for their long-term viability. This could create tensions and conflicts between policies for developing marine and coastal resources on the one hand, and conserving and protecting them on the other. The issues include overfishing, destructive fishing methods, habitat devastation, endangered marine species and marine pollution.

As a result of the new United Nations Convention on the Law of the Sea (UNCLOS), coastal states are obliged to protect and preserve the marine environment and to cooperate directly or through international organizations. An action plan for the conservation of nature in the ASEAN region has recently been formulated by IUCN. Priorities set by this plan are the:

- establishment of a network of natural reserves in the ASEAN region;
- enforcement of measures to protect endangered species;
- establishment of a mechanism for information exchange on research and management; and
- establishment of a regional training program on conservation management.

The need to maintain essential ecological processes and life-support systems to preserve genetic diversity and to ensure the sustainable utilization of species and ecosystems has been emphasized. A network of nature reserves, such as marine parks, biosphere reserves and wildlife sanctuaries, has been regarded as one of the most effective ways to conserve ecosystems and the genetic resources they contain.

On marine pollution, Part VII of UNCLOS, entitled "Protection and preservation of the marine environment," provides the basis for the enforcement of the provision. For example, articles 212-213 deal with the enforcement of regulations designed to prevent, reduce and control pollution. Articles 223-233 prescribe various safeguards in carrying out enforcement procedures.

The problem of enforcement of regulations against pollution of the sea by toxic, noxious or radioactive materials has two aspects: one, from mobile shipboard sources, principally tankers transiting the region or calling at the oil terminals, and the other, from fixed sources, such as oil wells and coastal sites.

The UNEP has supported a number of program activities related to marine and coastal environments in Southeast Asia. Examples are those under the Regional Programme on East Asian Seas which is concentrated in the ASEAN region. The UNEP implementing counterparts in ASEAN are the Coordinating Body of Southeast Asian Seas (COBSEA) and the ASEAN Experts Group on Environment (AEGE), which has now been elevated to the ASEAN Senior Officials on Environment.

In 1988, UNEP, in cooperation with COBSEA and AEGE, formulated the ASEAN Environment Programmes III (ASEP III), a five-year plan carried out between 1988 and 1992. The ASEP III is the continuation and extension of ASEP I (1978-1982) and ASEP II (1983-1987). The ASEP III has been officially endorsed by the ASEAN Committee on Science and Technology (COST), the ASEAN Standing Committee and the Third ASEAN Ministerial Meeting on the Environment.

Six areas have been given high priority in ASEP III, namely, environmental management, nature conservation and terrestrial ecosystem, industry and environment, marine environment, urban environment and environmental education, training and information. With the catalytic role of UNEP, ASEAN has adopted the "Action plan for the protection and development of the marine environment and coastal areas".

In the ASEAN Subcommittee on Marine Sciences, there is a very strong program committed to the management of coastal resources in the region, the ASEAN/US CRMP, now on its fifth year. The International Center for Living Aquatic Resources Management (ICLARM) has been appointed as the executing agency, and Dr. Chua Thia-Eng as the Project Coordinator.

The CRMP has two main components: the development of site-specific coastal resources management plans in the six ASEAN countries, which includes resource assessment, cooperative research and planning activities; and information dissemination and manpower development through publications, training activities, technical workshops and policy seminars.

The six project research sites are: the entire coast and estuarine system of Brunei Darussalam; Segara Anakan-Cilacap, South Java, Indonesia; South Johore,

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Peninsular Malaysia, Malaysia; Lingayen Gulf, Philippines; the coastal area of Singapore; and Phangnga and Ban Don Bays, Upper South, Thailand.

I would like to take this opportunity, on behalf of the ASEAN Subcommittee on Marine Sciences and ASEAN COST, to sincerely thank ASEAN/US CRMP as well as ICLARM for organizing this conference. We also extend our appreciation to the government and the people of the Republic of the Philippines for hosting the conference.

Finally, may I wish you a successful and fruitful deliberation so that the conference could attain its objectives on the management of ASEAN's coastal resources for sustainable development.

Responding to the Challenges of Coastal Resources Management in ASEAN*

THE HONORABLE CEFERINO L. FOLLOSCO

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Philippines*

FOLLOSCO, C.L. 1991. Responding to the challenges of coastal resources management in ASEAN, p. 5-7. *In* T.-E. Chua and L.F. Scura (eds.) *Managing ASEAN's coastal resources for sustainable development: roles of policymakers, scientists, donors, media and communities*. ICLARM Conference Proceedings 30, 125 p. Department of Science and Technology; Department of Agriculture; Department of Environment and Natural Resources; and Department of Tourism, Philippines; and International Center for Living Aquatic Resources Management, Philippines.

Abstract

This welcome address notes the rationale behind the implementation of the ASEAN/US Coastal Resources Management Project (CRMP) and follows its crucial stages of implementation. The Policy Workshop on Coastal Area Management marked a milestone which introduced an integrated approach to coastal resources management (CRM) and framed a set of policy recommendations for the ASEAN region. Another significant undertaking is this Conference on Managing ASEAN's Coastal Resources for Sustainable Development. Discussion of the multifaceted aspects and issues of resources management should evoke a deeper insight of the problems and their solutions towards enlightened decisions and choices. The effort of the Government of the Philippines in promoting this concept of integrated management through support of and collaboration with CRMP is also highlighted.

*Welcome Address delivered during the Opening Ceremonies of the ASEAN/US CRMP Policy Conference on Managing ASEAN's Coastal Resources for Sustainable Development on 4 March 1990 at the Manila Hotel, Manila, Philippines.

About four years ago, the need to manage coastal resources here in Southeast Asia was given a concrete response in the form of a project. That project was designed to develop and implement comprehensive, multidisciplinary and sustainable CRM plans through research, training and information dissemination. It was born out of a fellowship of concerned action among the members of ASEAN and the International Center for Living Aquatic Resources Management (ICLARM), with financial support from the United States Agency for International Development.

During those four years that the project has been in existence, the six ASEAN member-nations have each designated a pilot site, assessed resources and environmental problems and thought of ways to resolve these problems and to achieve sustainable development. Today, most of these countries are in their final stages of developing their CRM plans.

The Department of Science and Technology (DOST) has played a major role as the main coordinating agency in the Philippines of the ASEAN/US CRMP. The department has been working closely with ICLARM, the main implementing organization, and I am quite pleased to inform you that the Philippine project has been running well and producing encouraging results.

One important milestone in the history of the project was the Policy Workshop on Coastal Area Management held in Johore Bahru, Malaysia, in October 1988. Senior government officials and resource managers from the ASEAN countries were invited to acquaint them with the concept of an integrated approach to CRM and to obtain their endorsement and support for the plans being formulated then. A significant output of the exercise was a set of policy recommendations and a consensus among the participants on the need for CRM in the region.

This conference on Managing ASEAN's Coastal Resources for Sustainable Development, for which we are gathered here today, marks another milestone. It represents the continuing initiative and efforts of the project in pursuing the goal of sustainability, not only for the region, but for other parts of the world as well. Through this conference, policymakers, scientists and coastal planners are being brought together in a crucial dialogue which is expected to draw international attention and inspire similar moves worldwide.

Aside from its significance as a precedent of sorts, a number of other factors lend a special distinction to this conference. One is the presence of top-level ASEAN dignitaries and their delegations. Another is the enthusiasm of the Philippine government as conference host, clearly manifested by the extraordinary support provided by four co-sponsoring departments, namely--DOST, Department of Agriculture, Department of Environment and Natural Resources, Department of Tourism; and by the National Economic Development Authority; as well as by the Provincial Governments of Pangasinan and La Union.

The President herself, Mrs. Corazon C. Aquino, has been very supportive of this endeavor, for which I would like to take this opportunity to express our appreciation. In spite of her inability to come here due to her heavy schedule and myriad commitments, she is extending to all of you her sincerest greetings and thanks for your willingness to cooperate and contribute to this undertaking.

Finally, an even more important factor which, I believe, adds greater meaning to this gathering is the common concern we all share for responding promptly to the emerging resources management challenges of our region. Our presence here today is an unmistakable proof of this concern. I am optimistic that as we discuss and face the social, economic, political and technological aspects and issues of resources management, we will gain a better perspective not only of the problems, but also of their solutions.

Thus, on behalf of our government and our people, I welcome you all—with much honor and pride—to this important event. To our foreign delegates, may your visit be a pleasant and fruitful one. In case of any shortcomings on our part, please bear with us, although I wish to assure you that we will do our best to make your stay here as comfortable as possible.

I am confident that the thoughts and experiences we will be sharing in this conference will enable us to learn even just a bit more about how to make difficult but necessary decisions, and choices that are intelligent and informed, and how to be responsible stewards of the gifts of nature to our countries.

Sustainable Development of Coastal Resources: A Challenge and a Choice *

THE HONORABLE CATALINO MACARAIG

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MACARAIG, C. 1991. Sustainable development of coastal resources: a challenge and a choice, p. 9-14. In T.-E. Chua and L.F. Scura (eds.) *Managing ASEAN's coastal resources for sustainable development: roles of policymakers, scientists, donors, media and communities*. ICLARM Conference Proceedings 30, 125 p. Department of Science and Technology; Department of Agriculture; Department of Environment and Natural Resources; and Department of Tourism, Philippines; and International Center for Living Aquatic Resources Management, Philippines.

Abstract

Coastal resources constitute the lifeblood of a substantial portion of the ASEAN population and should not bear the ill consequences of economic development. Instead, the judicious management of the natural resources base should be inextricably linked with its sustainable development. Of the existing alternatives, integrated management using an interdisciplinary, multisectoral approach is the most promising since it tackles the resource exploitation-conservation predicament from every perspective, including the role of each responsible sector or stakeholder. Sufficient funds, cooperation, competence and skill, efficient law enforcement and decisive political leadership are likewise essential components for the smooth operation of a well-developed coastal area management (CAM) plan.

*Keynote Address delivered during the Opening Ceremonies of the ASEAN/US CRMP Policy Conference on Managing ASEAN's Coastal Resources for Sustainable Development on 4 March 1990 at the Manila Hotel, Manila, Philippines.

I am indeed very glad to be with you this afternoon to keynote your very important conference on "Managing ASEAN's Coastal Resources for Sustainable Development". Allow me to begin by speaking of the importance of natural resources to third world countries.

Developing countries' prospects for economic, social and political advancement precariously hinge on the state of their natural resources. These resources constitute the backbone of their economies, accounting for a substantial portion of total economic production, employment and exports. Most developing countries enter the world economy through exportation of their raw materials. They derive more than half of their annual foreign exchange earnings from these exports, which they use to purchase essential manufactured products from industrialized countries.

In the ASEAN region, some 70% of the entire population of over 300 million resides in coastal areas and thus relies heavily on coastal resources for livelihood. My country, the Philippines, has a total coastline of 17,460 km, its most prominent geographic feature being that it comprises over 7,000 islands. About 55% of the people resides in some 10,000 coastal *barangay* (village). The majority of the roughly 1 million people employed by the fishing industry are marginally poor, for whom few livelihood alternatives exist. Small-scale fisheries account for 75% of employment in fisheries and 50% of annual production.

Evidently, one of the key solutions to the problems of poverty and malnutrition in this country, as in most other developing countries in the region, is to build a greater degree of self-sufficiency in food, which is based on local natural resources. Aquatic resources are of special concern since in Southeast Asia, fish comprise more than 50% of the animal protein intake of the people.

Decreasing Sustainability of Resources: Who is Paying the Price?

Many of the world's most productive ecosystems are found in Southeast Asia. Its coastal zone is endowed with coral reefs, mangrove forests and seagrass beds, and its continental shelf is rich in mineral and oil reserves. Ironically, the developing countries of the region have not been able to derive the ultimate benefits from these resources. It is rather the developed and affluent countries which have profited more from the exploitation of such resources. Every year, some \$100 billion worth of these resources are taken from third world countries to developed countries, but only 60% of this amount goes back to the former.

Post-World War II reconstruction requirements prompted many poor countries, including ours, to welcome investment capital from the rich countries for rebuilding our shattered economies. The industries established by these foreign investors drew heavily from our natural resources for their production inputs. Our coastal resources were most severely affected since most of the economic activities in the region occur 3 km seaward and 10 km landward along the shoreline.

Over the years, it has become clear that the price being exacted for this "progress" is much too dear. In the name of economic development, our valuable living coastal resources are being exploited beyond the limits of their sustainability. Most Southeast Asian nations are now encountering problems of overfishing, especially after modern and more efficient gear have been introduced. Mangroves are being denuded for highly profitable aquaculture projects, human settlements and other development activities. In the Philippines, total mangrove hectareage was reduced from 450,000 ha in the early 1900s to approximately 149,400 ha in 1988. Coral reefs are being destroyed by blast fishing or mined for building materials, such that only 30% of the remaining reefs that were assessed is in good to excellent condition. As a result, our coastal environment is being seriously degraded: coastal land is being eroded, critical habitats are being damaged and coastal waters are being contaminated by domestic, agricultural and industrial wastes.

Managing Our Resources: The Time is Now

As developing nations, we must all recognize the close interrelatedness of sustainable development and the judicious management of our natural resources base, which is our most precious "capital" for this development. We need to foresee the probable consequences of different patterns of resource exploitation for economic development vis-à-vis such noneconomic values as conservation of living species and stocks and preservation of the critical habitat. And we need to do this now--before the damage to the renewable resources of the region becomes irreparable. For while on the one hand, we have been describing the gloomy picture of our environment, on the other hand, we must not miss the glimmer of hope offered by existing alternatives. We can do something, but it is important for us to do it together.

Integrated Management of Coastal Resources

One of the most promising and creative options now available to us is the concept of integrated coastal resources management (CRM), which pursues an interdisciplinary and multisectoral approach. Affected communities are consulted and the sociocultural disruptions that are likely to accompany economic and technological changes are considered in the planning process. As opposed to the unisectoral approach currently being practised in the ASEAN region, integrated management tackles the resource utilization-conservation dilemma from various aspects and angles, linking engineers, scientists, resource managers, economists, government officials, policymakers, sociologists and local communities in a complex but rational strategy of data-gathering, consultation, planning and decisionmaking.

Integrated management aims development plans primarily towards long-term sustainability, more than short-term economic benefits. It recognizes the linkages and interdependence between upland ecosystems and lowland coastal and marine ecosystems and considers the two as one large system in the building of management models.

However, in weighing alternative options for development, it must be stressed that the economic importance of lowland resources far exceeds that of the uplands, and thus the former should not be sacrificed in favor of the latter.

Current Efforts at Coastal Resources Management in the Philippines

It is certainly encouraging to note that while unisectoral approaches to resources management are still predominant, integrated CRM is slowly gaining ground. Current management efforts here in the Philippines are becoming more and more visible, as exemplified by the initiatives taken by the ASEAN/US Coastal Resources Management Project, which is implemented by the International Center for Living Aquatic Resources Management (ICLARM). Promising results have been achieved so far, particularly in the formulation of CAM plans for the Lingayen Gulf. With the coordination of national government agencies, officials of the 18 coastal municipalities have been mobilized to actively participate in the planning process, for which a "bottom-up" approach was adopted. Seven specific draft action plans and an integrated CAM plan have either been completed or are awaiting refinement and improvement.

Congruent to the multisectoral character of integrated management, the draft plans were prepared by a task group comprising members from academic institutions, government agencies and nongovernmental organizations (NGOs) based in the region. Most of the plans emphasize consultation with the local populace, resource users and other affected parties.

Roles and Contributions of the Different Sectors

Beyond the need to get every concerned group involved in the planning process is the importance of clarifying each one's role and contribution to the overall ideal of integrated CRM and its successful implementation.

Government leaders will have to transcend their own political interests and stop treating natural resources as infinite and merely as tools for strengthening their own political power base. They should not view CRM as "anti-development" or purely a "conservationist" stance, but rather as a viable strategy for improving the quality of life of the people whom they have vowed to serve, through increased food supply, alternative livelihoods, employment and investment opportunities and long-term solutions to multiple-use resource conflicts.

The *coastal populations* must be allowed to benefit from their own resources but first, must be made to realize that such is their right. They must be mobilized to

take active part in the planning of their own resources and environment, and thus, in charting their own future. Community organization can be used as a means of drawing them into the planning process and getting their voice heard by policymakers.

There is no doubt that the contribution of the *private sector* as a prime moving force is crucial to economic development. In a developing country like ours where limited financial resources must be allocated by government among many competing needs of various degrees of urgency, the private sector is counted upon to provide the investment capital and technology to initiate and sustain the productive use of resources. The real challenge, though, is to be able to maintain a balance between economic profitability and environmental soundness. In most instances, in the pursuit of individual or group gains, the respect for the integrity of nature and the concern over the impact of business operations on the lives of people are lost somewhere along the way.

The complex relationship between economic development and care for the resource base should also be more deeply appreciated and considered by *donor agencies* in their choice of development projects to support. It is sad to note that although patterns of environmental degradation in developing countries are emerging clearly, international development policy has failed to halt such trends and sometimes even accelerates the destruction. Multilateral and bilateral development aid has been geared towards boosting agricultural productivity, facilitating industrial expansion, improving physical infrastructure in rural areas and slowing down population growth, but has practically ignored the need to sustain the natural resource base over the long term.

The initiatives of NGOs in resources management deserve commendation. NGOs have played an important role in filling up the gaps left by government inaction. NGOs, such as ICLARM and the World Wildlife Fund, have in fact earned the reputation of being more efficient in assisting the poor people of developing countries and of being more participatory and innovative in their approach. They are also known to be skilled at community organization, being more in touch with the people at the grass roots level.

The Lingayen Gulf project provides a fine example of how NGOs can facilitate resources management efforts. Several NGOs worked together in obtaining in-depth sociocultural and socioeconomic information as inputs in the CRM planning process or were at one point or another members of task groups which drafted action plans.

NGOs involved in environmental issues have a unique role in helping development agencies or organizations reorient their projects towards the use of methods compatible with standards of resource sustainability.

Will Coastal Resources Management Really Work in the ASEAN? – Constraints and Hopes

Before I close, I would like to pose an important question: Will CRM really work here in the ASEAN region? The fact that we all chose to be here today is

already a hopeful sign of a positive answer. However, the question is not for us to answer now, but rather, to take with us to reflect upon when we settle back to our own respective places and roles in government, in scientific research, in development work, in the community.

To be able to get a well-developed CAM plan off the ground and running smoothly, we will need many things: sufficient funds, a cooperative spirit among the various agencies and organizations involved, competence and skill in resources management, efficient law enforcement, and above all, firm political will and leadership.

Government leaders are the ones in a position to put ecological dimensions of policy directions on the same agenda as trade, energy and agricultural and industrial dimensions. The national government will have to see to it that sustainable development principles are integrated into the mandates of all government agencies.

In the Philippines, a specific challenge being addressed to the government is to endorse already existing or ongoing CRM efforts, and to provide the necessary institutional and financial support. With the encouraging results of the Lingayen Gulf project, the area should be declared as a special management zone, so that the gulf may serve as a working model for national and eventually, regional CRM programs. A working model like this will be able to provide us with a concrete basis for answering the question I posed earlier.

In closing, I wish to stress that while the extent of damage to our environment and natural resources should alarm us, it should not overwhelm, nor paralyze us. For we still have a choice, and how lucky are we that we do. We have concrete options and alternatives at our hands, as has just been shown, and will again be shown later, throughout this conference.

I hope we will emerge from this gathering strengthened by this knowledge and inspired by a sharper vision of sustainable development.

The Value of Coastal Resources in National Economic Development*

HIS EXCELLENCY CHUAN LEEKPAI

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LEEKPAI, C. 1991. The value of coastal resources in national economic development, p. 15-19. In T.-E. Chua and L.F. Scura (eds.) *Managing ASEAN's coastal resources for sustainable development: roles of policymakers, scientists, donors, media and communities*. ICLARM Conference Proceedings 30, 125 p. Department of Science and Technology; Department of Agriculture; Department of Environment and Natural Resources; and Department of Tourism, Philippines; and International Center for Living Aquatic Resources Management, Philippines.

Abstract

The fact that all six ASEAN members are coastal nations with some 25 million Asians relying on fisheries, aquaculture and allied industries underscores the value of coastal resources in national economic development. Historically and until the present day, Southeast Asian seas have been passageways for the transfer of commodities, peoples, cultures and technologies. Drawing from the Thai experience, and citing the advances made in integrated coastal resources management (CRM) through the ASEAN/US Coastal Resources Management Project (CRMP), this keynote address exhorts ASEAN leaders to follow well-structured, specific policies for the sustainable utilization of coastal resources and the development of coastal areas.

On behalf of my delegation, may I first of all congratulate the International Center for Living Aquatic Resources Management (ICLARM) and all the institutions and individuals who are involved in the organization of this very important and timely conference.

*Keynote Address delivered during the ASEAN/US CRMP Policy Conference on Managing ASEAN's Coastal Resources for Sustainable Development on 5 March 1990 at the Hyatt Terraces, Baguio, Philippines.

May I also take this opportunity to express my thanks and appreciation to the government and people of the Philippines for the warm welcome and kind hospitality they have shown us since our arrival in this wonderful country.

I am confident that with the vast pool of knowledge and experience represented here, the beautiful surroundings of Baguio and our strong determination and resolve, our deliberations will be most productive and most useful for the entire region.

I understand that this conference has brought together a distinguished group of international officials, scientists, experts and members of the media to consider the management of coastal resources in the ASEAN region. I can claim little technical expertise here. Nonetheless, as I discussed the program of this workshop with my staff, I realized that CRM has become a very serious concern at home in Thailand, and also in the ASEAN region. Of course, when something becomes a serious national concern, it usually involves many people and various interest groups, all of whom may have very different viewpoints about how to resolve the issues. In other words, it involves politics and national administration. And *that*, at least, gives me some credentials for addressing you here.

Let me begin then by pointing out that the six ASEAN members together have one of the most significant coastlines in the world. We have more than 106,000 km of coastline, that is almost 60% of all the coastlines in Asia, more than the combined coastlines of all South American and African countries and 85% of the coastline of Europe. In fact, only three countries in the world rival our coastline: Canada, the Soviet Union and Greenland. Of course, much of the coastline of these northernmost countries lies within the Arctic Circle, and is, therefore, more frigid, though perhaps no less fragile, than our own shores. Moreover, it cannot be denied that there are more people and economic activities along our coastal zone than in any other single nation or region in the world.

Indeed, all of our ASEAN members, so well-represented here, are archipelago nations--Indonesia and the Philippines; or island nations--Singapore and a significant portion of Malaysia; or part of an island--Brunei Darussalam; or long peninsulas--Malaysia and my own country, Thailand. As such, ASEAN can be said to be an association of coastal nations.

The value of our coastal resources to national economic development can be appreciated whenever we travel from one ASEAN country to another. As our plane took off from Bangkok yesterday morning, we ascended southward toward the Gulf of Thailand. Passing over Bangkok, the Chao Phya River was lined with cargo ships, having sailed from far corners of the world, passing through our neighbor's coastal waters as well as our own. As our plane reached the gulf, the ricefields near the mouth of the river faded into salt farms or shrimp ponds, *marking the beginning* of aquaculture development which has a major impact on coastal areas around the country.

Off to the left was our Eastern Seaboard Industrial Development Project area, which includes the new seaports of Laem Cha Bang and Mab-Ta-Phud, the busy resort of Pattaya and the quieter beaches of Rayong and Samui Islands. The industrial development associated with these new seaports has generated a tremendous increase in population and housing in this region, with a consequent rise in land values, not to mention skyrocketing demands for fresh water,

construction materials and recreational resources. In Pattaya and in other resorts along our coasts, growth has been at a frenzied pace, and along with rampant growth has come pollution, like a dark smudge on the picturesque scenes of beautiful beaches. We can now see very clearly that, unless quickly resolved, the problem of water pollution will pose a serious threat to the continued success of our tourism industry.

As we flew beyond sight of land and passed over the South China Sea toward Manila Bay, we saw occasional cargo ships and trawlers far out at sea. The Southeast Asian seas support highly productive fisheries—some 2,500 species of fish and many other marine animals. More than 10% of all the marine fish catch in the world comes from our waters. Some 5 million people are coastal fishermen, and some 25 million—more than the populations of Malaysia, Singapore and Brunei Darussalam combined, or almost half the population of Thailand—are estimated to be directly dependent upon fisheries or aquaculture and related industries. Experts recognize that several of our key water bodies—the Strait of Malacca, Gulf of Thailand, Manila and Jakarta Bays—have some of the most productive, but overfished and degraded fisheries in the world.

Historically, our seas have been both isolating barriers and highways for the transfer of goods, peoples and cultures. There is increasing evidence to support the hypothesis that our region has long been a crossroads of civilizations, with ancient navigators from the New World transferring culture and technologies across the Pacific, through our archipelagoes and up to the Asian mainland, rather than the one-way flow from the Middle East and northern Asia. Certainly for the past 1,000 years, it is indisputable that the seasonal monsoons enabled navigators from the Middle East to sail to the Pacific, and the Chinese to sail westward to the Middle East, thereby establishing the trade routes for East Asian spices, and more recently, for timber, tin, rice, coffee and tea, sugar, palm oil, rubber and other commodities.

Today, our seaways are also arteries for the modern cargoes of petroleum and manufactured goods, among Europe, the Arab Gulf and the industrial powers of Japan, Republic of Korea, Taiwan and North America. This traffic, particularly, petroleum, passes through the narrow seaways of the Strait of Malacca or the Strait of Lombok with some considerable risk to our own shorelines.

I am told that a prime concern of cooperative efforts in CRM among our ASEAN countries is to prevent and to prepare for the possible disaster of a major oil spill. Exxon is reported to have spent US\$3 billion to clean up the oil spill in Alaska last year. Suppose such a spill occurs in the Strait of Malacca, the Gulf of Thailand or the waters of the Philippines—waters that produce more than a ton of fish per square kilometer annually. What would be the price of a comparable spill in our waters, on our coastline?

Our own actions also threaten our coastal waters. Bangkok, Kuala Lumpur, Jakarta, Bandar Seri Begawan, Singapore and Manila are all coastal cities or just upriver from the coast. Sewage and industrial wastes from our capital cities are major sources of pollution. Singapore already treats 80% of its sewage, but I think that for the rest of us, the figure is far lower, in fact, almost nil.

We have no specific estimates of the economic contribution of coastal resources to our Gross National Product, but the figure must be significant,

probably 10-20%, depending on how the coastal zone is defined and which economic sectors are included.

Information derived from the ASEAN/US CRMP working with the Thai Office of the National Environment Board in the Ban Don Bay off Surat Thani in the Upper South of Thailand, offers a good indication. More than 20% of the region's Gross Domestic Products comes from fisheries, aquaculture, mangrove forest products and related coastal resources. The Upper South is a rich fisheries region and is also a traditional site for aquaculture of shrimp, cockles, oysters and mussels and cage culture of groupers and sea bass.

Nonetheless, there are limits to this productivity. While aquaculture has expanded rapidly over the past two decades, reports now indicate high levels of bacteria from domestic wastes and pesticides in some of our shrimp pond areas. Trawling in shallow bay has also reportedly been disturbing the bottom habitat so that shellfish are no longer growing well. A new hydroelectric dam well upstream of the bay has decreased the natural flows of water and oxygen, which would normally help dilute and absorb wastes.

Whether looking at the coastline near Bangkok, the Eastern Seaboard, the Upper South region of Ban Don Bay or further south to Phuket and Songkla, it has become increasingly and painfully obvious that our economic growth—virtually unrestrained growth—has caused very serious negative effects upon our coastal areas. Our planning, monitoring, coordination and enforcement have not been able to prevent widespread occurrence of detrimental activities that erode the gains of our economic success and even threaten further growth in the future.

In the past, we have generally attempted to regulate coastal areas from the viewpoint of a particular ministry or agency or a single interest group. Now, however, we are beginning to realize that we must coordinate with various interest groups to reverse the increasingly negative socioeconomic effects of coastal resources exploitation. We must also adopt a longer-term perspective, and consider how our children and their children will continue to benefit from these natural resources.

The ASEAN/US CRMP is a good example of the positive results attainable through integrated CRM. The pilot sites for the project component in Thailand, Ban Don and Phangnga Bays, are already benefitting from the management plans developed. For instance, a mangrove management plan for Ban Don Bay was approved by the Cabinet last year. We also look forward to the project's plans to employ the latest remote sensing technologies and geographic information systems to provide rapid evaluation of environmental changes, which will allow for more effective coastal zone planning and management.

At the third ASEAN Ministerial Meeting on Environment held in Jakarta in October 1987, it was declared, "That ASEAN member countries adopt the principle of sustainable development to guide and to serve as an integrating factor in their common efforts." The concept of sustainable development has become a common rallying point, I believe, for both environmental scientists and development planners. The next Ministerial Meeting will be in Malaysia this year, and I am confident that it will set the stage for further efforts to promote sustainable development involving the peoples of ASEAN working cooperatively.

Through the ASEAN/US CRMP, ICLARM has made a positive and worthwhile contribution by providing the much needed technical leadership in assisting the countries of the region to develop working models of integrated CRM, and by systematically promoting interagency collaboration, increasing public awareness and supplying useful technical information essential for policy decisionmaking. In this connection, I should like to congratulate ICLARM for bringing together, in this workshop, the relevant political leaders of the region and for providing the opportunity for us to interact as a group with technical experts, donor agencies and the media.

Other natural resources and environmental issues are also gaining priority in the region--reforestation and watershed protection, water quality and supply, and wildlife protection. There are also some very troublesome environmental pollution issues in urban areas, which include air and water pollution, garbage disposal and control of hazardous wastes. Because the coastal zone is the main focus for most human activities, and because of the complexities of the ecosystems involved, it may be fair to say that CRM is both difficult and essential to implement. I think our conference organizers realize this very well, and that is precisely why we are here.

Given proper resolve from each of us, this conference can contribute significantly to a new era of development in the ASEAN region. In order to guarantee the arrival of this vital and long-awaited period in the economic history of our region, ASEAN leaders will need to adopt and follow a set of well-devised policies that must set specific guidelines for the sustainable use of coastal resources. This conference provides an unprecedented assembly of people capable of drafting such a policy resolution. Let us make maximum use of this historic opportunity to improve the management of our coastal resources, and to safeguard the ushering in of an era of sustainable development in the ASEAN region.

Session 1: Current Efforts in Coastal Resources Planning and Management

Managing Coastal Resources for Sustainable Development: The ASEAN Initiative

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CHUA, T.-E. 1991. Managing coastal resources for sustainable development: the ASEAN initiative, p. 21-35. *In* T.-E. Chua and L.F. Scura (eds.) *Managing ASEAN's coastal resources for sustainable development: roles of policymakers, scientists, donors, media and communities*. ICLARM Conference Proceedings 30, 125 p. Department of Science and Technology; Department of Agriculture; Department of Environment and Natural Resources; and Department of Tourism, Philippines; and International Center for Living Aquatic Resources Management, Philippines.

Abstract

This paper describes the significance of coastal resources to the ASEAN members. The initiatives they have undertaken to develop an integrated approach to the management of the coastal areas in line with the principle of sustainable development are also discussed. The objectives, activities and achievements of the ASEAN/US Coastal Resources Management Project (CRMP) are highlighted.

The Special Significance of ASEAN's Coastal Areas

Coastal areas are economically important throughout the world, especially in the ASEAN region. Table 1 shows how coastal resources contribute to the economies of the region. In the Southeast Asian coastal areas, interactions between land and sea result in many intense biological and physical processes.

Table 1. Some economically significant coastal resources and industries in the ASEAN region.

Resource/industry	Revenue (US\$)
Coastal forestry	180 million (5% of total forest production, Indonesia, 1987)
Oil and gas	3.1 billion (97% of total foreign trade, Brunei Darussalam, 1987)
Fisheries	1.2 billion [4% of Gross Domestic Product (GDP), Philippines, 1986]
Shipping ^a	100 million (15% of ocean-borne foreign trade, Malaysia, 1986)
Marine industry ^b	651 million (4% of GDP, Singapore, 1985)
Coastal tourism ^c	650 million (2% of GDP, Thailand, 1987)

^aDirect earnings from national fleet but excluding interisland shipping.

^bShip repair and building, rig construction.

^cFor Pattaya, Phuket and Ko Samui.

Sources: Anat et al. (1987); Chua (1988); and Yahaya (1988).

Coral reefs are one important coastal ecosystem. Roughly 30% of the world's coral reefs is found in the region (McManus 1988). They have the highest primary productivity of any coastal ecosystem, contributing about 10 to 30% of total fisheries catch annually.

Another productive coastal ecosystem is the mangrove forest. About 26% of the world's mangrove forests is found in the ASEAN region. Mangroves are natural barriers against storm surges and strong winds. They serve as nursery and feeding grounds for many commercially important aquatic species like shrimps, milkfish, mullets, oysters, etc. They contribute to nearshore and offshore productivity through release of nutrients. Mangroves trap sediments contributing to coastal land formation. They are sources of fuel materials like wood and charcoal, building materials, drugs, food and industrial chemicals such as dye, tannin, cellulose and alcohol. The areal extent of mangroves in the region is shown in Table 2.

Table 2. Areal extent (ha) of mangroves in the ASEAN region.

	Areal extent (1988)	% of world's mangroves
Brunei Darussalam	18,418	<0.1
Indonesia	4,251,011	20.5
Malaysia	628,671	3.0
Philippines	149,400	1.1
Singapore	500	-
Thailand	287,308	1.4
Total	5,335,308	26.1

Source: Modified from Paw and Chua (in press).

Other important coastal ecosystems are seagrass beds, estuaries and beaches. Seagrass beds are important habitats for many aquatic species and serve as feeding grounds for turtles and dugong. Seagrasses bind shallow-water sediments and therefore, contribute to shoreline stability. They also serve as buffers by reducing water turbidity and lowering pollution levels (Fortes 1990).

Estuaries are highly variable environments being influenced by both freshwater and seawater interactions. Many estuaries in the region have fringing mangroves which tend to attract human settlements. Due to ease in commerce and navigation, many coastal cities are sited along estuaries like Manila, Jakarta and Bandar Seri Begawan. Major estuarine systems include Mekong, Chao Phraya and Kapuas river systems.

Beaches are economically important as sites for resorts that draw foreign and domestic tourists. Prime beaches are found in Bali, Indonesia; Trengganu, Malaysia; Boracay, Philippines; and Phuket, Pattaya and Ko Samui, Thailand. Revenues from coastal tourism are substantial and contribute to foreign exchange earnings (Table 3).

Table 3. Economic contribution of coastal tourism in the ASEAN region.

	Coastal/marine tourists	Gross revenue (US\$ million)
Brunei Darussalam	5,600	Not available
Indonesia	16 million ^a	423 (1987)
Malaysia	3.3 million ^b	679.2 (1987)
Philippines	0.4 million ^c	247 (1987)
Singapore	3.2 million ^d	1,050 (1986)
Thailand	1.6 million ^e	650 (1987)

^aAssumed 50% of domestic and 68% of international tourist visit.

^bInternational tourist arrival; contribution of coastal tourism not quantified.

^cAssumed 54% of international tourist arrival.

^dInternational tourist arrival for 1987.

^eInternational tourist arrival in three major coastal resorts: Phuket, Ko Samui and Pattaya.

Sources: Anat et al. (1987); CIDA (1987); and Yahaya (1988).

Since coastal areas support a broad range of economic activities such as fishing, aquaculture, tourism, agriculture and maritime commerce, coastal areas in the ASEAN region have attracted millions of residents. The population has steadily increased over the years with growth rates ranging from 1.27% for Singapore to 2.49% for the Philippines. By the year 2025, the ASEAN population will have grown from 300 million to an estimated 500 million. Table 4 shows that 60 to 100% of the population in four ASEAN countries lives in coastal areas. Although data for Malaysia and Thailand are not available, the percentage of their coastal population can be reasonably high.

Table 4. Estimated coastal population in the ASEAN region.

	Total population	Coastal population
Brunei Darussalam	221,900 (1985)	200,000 (90%)
Indonesia	166.4 million (1986)	102 million (60%)
Philippines	58 million (1987)	50.5 million (87%) ^a
Singapore	2.6 million (1986)	2.6 million (100%)

^aLiving within 50 km from the coast.

This large percentage of coastal residents may be due to greater socioeconomic opportunities in the coastal areas. However, the economic prospects of coastal resources utilization are *not* unlimited. Thus, demands by the growing population are now resulting in overexploitation, resource use conflicts, environmental degradation and major losses in investment opportunities.

These resulted from a lack of information on the proper use of coastal resources, sectoral miscoordination and poor planning; in other words, from a lack of integrated coastal area management (CAM).

If the pattern of improper and excessive use continues, the goal of sustainable economic development will remain unattainable. It was from concern over this frightening prospect that the ASEAN/US CRMP was initiated in 1986.

The ASEAN Initiative

The ASEAN/US CRMP addresses the urgent need to manage the region's coastal resources effectively. Their use must be carried out in a manner that allows for economic development yet does not destroy the future productivity of the environment. The project's goal is to promote sustainable economic development in the ASEAN region by strengthening existing capabilities to develop and implement comprehensive, interdisciplinary and environmentally sustainable CRM strategies.

This goal is to be reached by accomplishing the following objectives:

- analyze, document and disseminate information on how coastal resources are being developed for economic purposes;
- increase public awareness of the importance of policies on managing the coastal resources and identify, and where possible, strengthen existing management capabilities of local and/or national institutions within the region;
- provide technical solutions to resolve conflicts arising from multiple use of the coastal resources; and
- encourage various organizations and agencies to adopt multisectoral planning for the development of coastal resources.

Developing Coastal Area Management Plans

The ASEAN/US CRMP is being executed by the International Center for Living Aquatic Resources Management (ICLARM) and funded by the United States Agency for International Development (USAID) for a period of six years (1986-1991). ICLARM provides technical and administrative support as well as facilitates overall project implementation. Establishing overall policy directions and overseeing and evaluating project activities and performance are the responsibilities of the project's Steering Committee which is composed of representatives from each of the ASEAN countries.

The CRMP undertakes assessment of the coastal resources, cooperative research and planning activities in collaboration with 47 national institutions and over 200 scientists and resource managers in the region (Fig. 1). These activities are done in six pilot sites leading to the development of site-specific CAM plans. Research activities cover several areas such as biogeographical studies, socioeconomics, legal and institutional aspects, among others. The information gathered from these studies is translated into database useful for planning purposes.

The planning process

The initial phase of the CAM planning process was the preparation of the coastal environmental profile of each of the pilot sites using secondary data (e.g.,

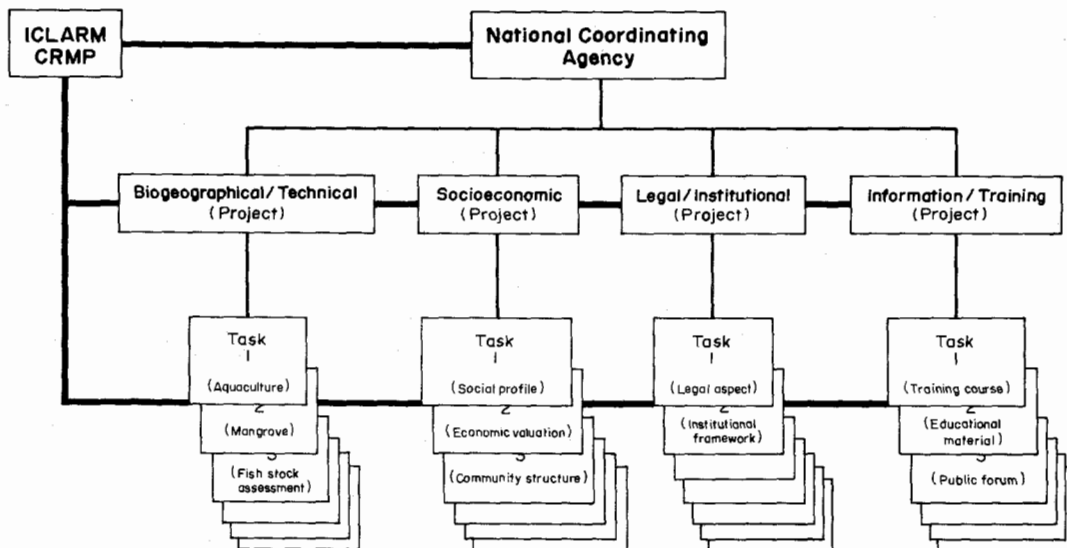


Fig. 1. Collaborative and coordinated research through a network of national institutions.

literature review) and primary data (e.g., actual survey). The profile gives an in-depth picture of the pilot site and enables the project participants to determine data gaps and quantify management issues that have significant socioeconomic impact. The profiles and national workshops provide direction for resource assessment, plan formulation and issue-oriented research. Multidisciplinary research teams are formed to gather and/or generate relevant information for plan formulation (Fig. 2).

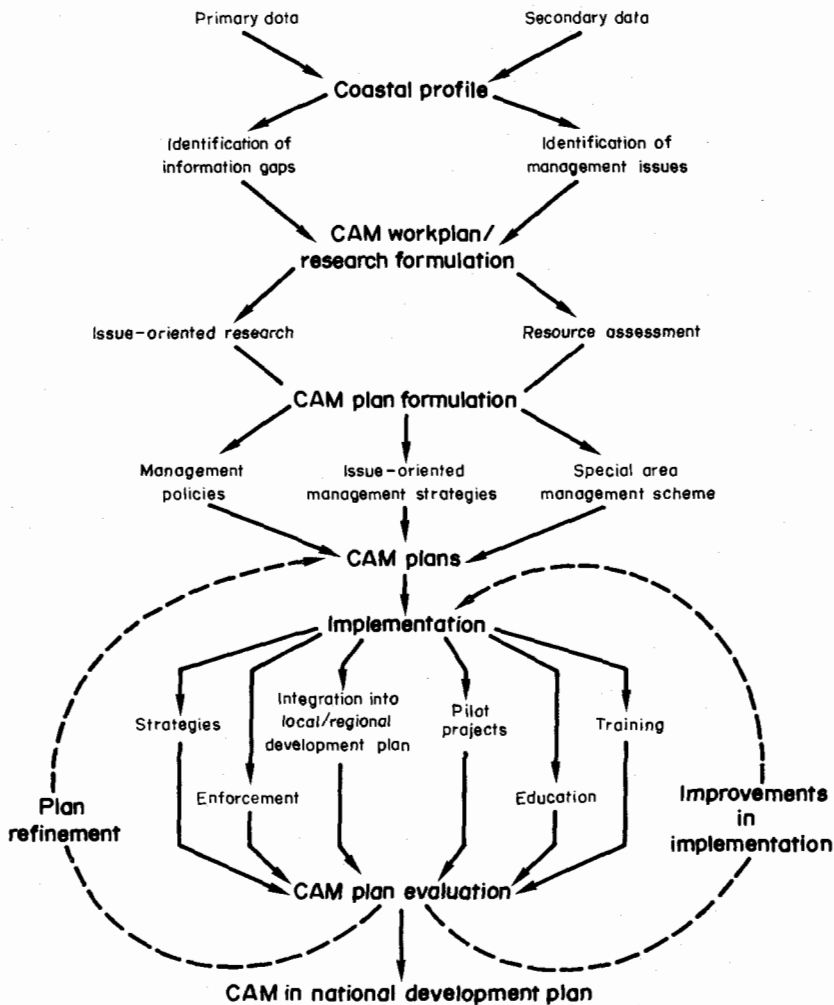


Fig. 2. Processes in identifying CAM issues and formulating integrated CAM plans.

Most research activities have already been completed, especially those on resource assessment, socioeconomics, legal and institutional aspects. The integrated CAM plans include: situational analysis, policies, zonation schemes, institutions (legislation, manpower), law enforcement, monitoring and evaluation and budget.

The plans for the six pilot sites (Fig. 3) consist of a general plan and several issue-driven action plans. The general CAM plan is designed to cover policy and zonation schemes which set environmental management criteria for economic activities. The zonation schemes cover various special areas or zones for sustainable management of the resources found therein. Examples are zones for fisheries management, mangrove management, coral reef and marine park, aquaculture management and land use. Legislation and manpower requirements are also included in the general plan to ensure adequate law enforcement and effective implementation.

Issue-oriented action plans are formulated to address management issues on water quality, aquaculture, fisheries, coral reefs, mangroves, island reserves and marine parks. For instance, under the water quality management plan, each ASEAN country has different problems to address such as land reclamation and sedimentation for Singapore, deforestation and sedimentation for the Philippines and Indonesia; domestic wastes for Brunei Darussalam, Malaysia and Thailand, and an oil spill contingency for Brunei Darussalam.

The action plans consist of specific policies and objectives, issues and causes, recommended strategies, guidelines on resource use/development, institutions and laws involved in implementation as well as a timetable and cost of implementation.

Coastal Resources Management in the Pilot Sites

Brunei Darussalam

The entire coastline and offshore waters are included in the management area for Brunei Darussalam. The thrust of the general management plan is to zone the resources according to locations and use patterns and to set up use guidelines.

The management issues affecting the country are:

- red tides;
- pollution from oil spills, industrial and domestic wastes;
- coastal erosion and sedimentation caused by beach sand and gravel mining, deforestation of coastal forest for human settlement and industrial development; and
- prevention of overexploitation and habitat destruction from accelerated economic development.

Several management plans are currently being developed to address these issues:

- water quality management plan which covers sedimentation control, pollution from industrial and domestic sources notably the water village, Kampong Air;

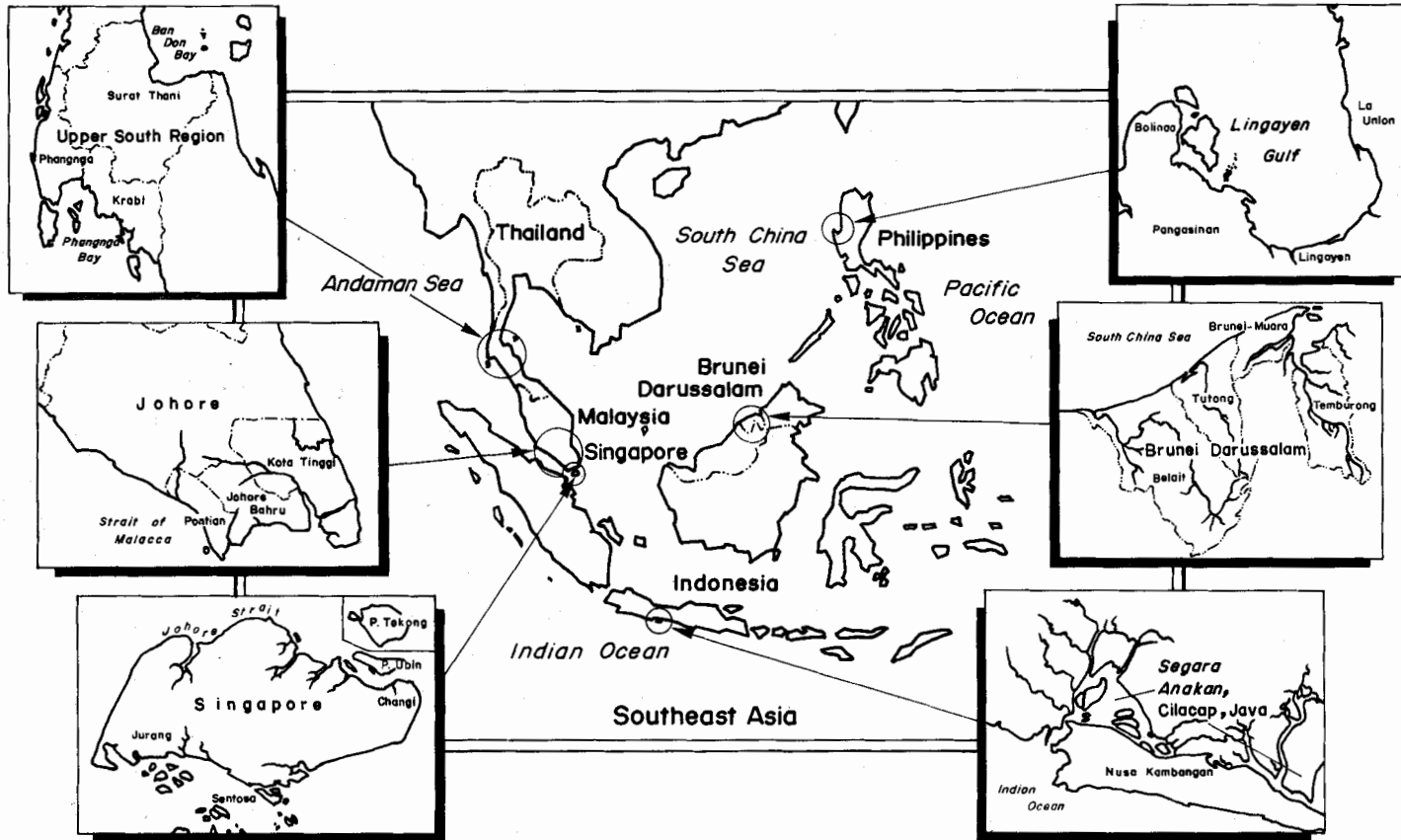


Fig. 3. The six ASEAN pilot sites at which integrated CAM plans are being developed.

- red tide action plan for monitoring of red tide occurrences and protection of public health;
- mangrove resources management plan for the sustainable development of the mangrove resources, including zonation for human settlements, aquaculture and such other activities;
- oil spill contingency plan for addressing oil spills, protection of critical areas and cleanup procedures;
- coral/artificial reef management plan which covers the fisheries resources developed around oil rigs and underwater pipelines; and
- fisheries resources management plan for the sustainable development of these resources.

The CAM plan formulation is being coordinated by the Department of Fisheries with other departments or ministries.

Cilacap, Indonesia

In Indonesia, the main focus is Cilacap-Segara Anakan. The lagoon, which ecologically supports an extensive offshore shrimp fishery, is decreasing in size due to deposition of sediments from the watershed. Planning involves management of the lagoon and the socioeconomic activities dependent on it.

Key issues that have been identified are:

- high levels of sedimentation in the lagoon resulting from improper upland agricultural practices, modern flood control measures and natural causes (the lagoon's surface area is estimated to decrease from the current 1,400 ha to about 500 ha by the year 2000);
- loss of mangroves and tidal swamplands which support traditional fisheries;
- overfishing and use of destructive fishing methods and gear like fine-meshed nets;
- agricultural runoff and potential pesticide and oil pollution in the lagoon;
- improper utilization of the mangrove forest;
- large inputs of silt, resulting land accretion and decreasing size of the lagoon; and
- declining socioeconomic/livelihood status of the already poor inhabitants of Segara Anakan.

Apart from the general zonation plan, several issue-oriented action plans have been developed to resolve the management issues:

- mangrove habitat management plan which covers zonation of mangroves for various uses/development and practical actions to implement the plan;
- lagoon fisheries management plan which covers the sustainable utilization of the fisheries resources within the lagoon; includes guidelines on gear used;
- water quality management plan which addresses sedimentation;
- land use zonation plan which involves zonation of the whole pilot site

for various developments in agriculture, mangrove reserve, mangrove conversion, human settlements, etc.;

- socioeconomic and alternative livelihood development plan which addresses socioeconomic issues affecting the communities along the lagoon, including their economic upliftment through alternative livelihood programs; and
- marine protected area plan which deals with the management and zonation of coral reefs and marine parks for tourism, preservation, traditional utilization and rehabilitation.

The CAM plan formulation and implementation are being undertaken by various local and national agencies with the Directorate General of Fisheries as the coordinating agency. The local government and regional planning agency at Cilacap will also have a major role in implementation.

South Johore, Malaysia

The plan seeks to provide sustainable management of South Johore's resources and minimize use conflicts, especially among tourism, aquaculture and industrial development.

Management issues identified are:

- conversion of coastal forests/mangroves to agricultural and shrimp pond areas;
- heavy exploitation of fisheries that decrease the volume of landings, increase the trash fish component and endanger a number of species;
- tourism development without adequate planning and control;
- industrial and domestic pollution ;
- coastal erosion due to improper conversion of natural ecosystems to other uses; and
- uncontrolled growth of certain agricultural-livestock/industrial activities leading to pollution and habitat degradation;

The management plans being developed for South Johore cover coastal and mangrove forests, aquaculture, sand mining, coastal erosion, water quality, tourism and fisheries.

A Central Committee, composed of representatives from line agencies, federal and state economic planning units and universities, oversees the planning process. A State Committee that includes heads of line agencies of the State of Johore, also participates in the planning process. The plans will be first endorsed to the State and Federal Committee levels before being transmitted for approval by the State Government.

Lingayen Gulf, Philippines

Planning activities address the management of fisheries, marine parks, aquaculture, tourism and water quality. Key issues identified are:

- overfishing due to use of inappropriate fishing gear and dynamite and commercial trawling (those based within the gulf and from other areas of the country);
- habitat destruction, especially coral reefs, due to dynamite fishing and use of cyanide to catch aquarium fish;
- pollution and sedimentation due to domestic wastes, agriculture and aquaculture loads and mine tailings from upland mining;
- unregulated tourism development resulting in beach erosion or destruction of coral reefs;
- conflict between commercial trawlers and municipal fishermen due to encroachment of the former within the 7-km-from-the-coast fishing boundary set for municipal fishing; and
- socioeconomic problems of coastal fishermen due to lack of an alternative livelihood program and functional education, and poverty.

Several action plans have been developed to address these issues:

- fisheries management plan which focuses on the sustainability of fisheries resources within the gulf, including the enforcement of regulations on municipal and commercial fishing boundaries, gear size, etc.;
- environmental quality management plan which covers water quality, waste disposal and treatment, mine tailings and establishment of coastal water standards;
- aquaculture management plan which includes increasing production through appropriate technology transfer, mariculture of oysters, seaweeds and cage culture of finfish;
- community mobilization management plan which aims to address alternative livelihood for the coastal communities, especially fishermen; also includes the formation of associations or cooperatives as well as a CRM public awareness program for the gulf population;
- tourism management plan which covers tourism development and the promotion of nature-based tourism and local community involvement;
- coral reefs and marine parks management plan which addresses the conservation and preservation of coral reefs, seagrasses and other critical habitats as well as provides options for their sustainable development.

The general zonation plan and the action plans are being developed by the regional office of the National Economic Development Authority (NEDA). A Regional Planning Steering Committee, represented by the governors of Pangasinan and La Union, representatives of the mayors of the 18 coastal municipalities, head of NEDA, technical experts and other provincial officials, oversees plan formulation as well as recommends these plans for adoption by the Provincial and Regional Development Councils.

Singapore

The main concerns of the Singapore management plan are the optimal use of ocean space and coastal areas as well as the improvement of water quality and

rehabilitation of degraded marine habitats like coral reefs. The CAM plan, which is being developed by experts from the National University of Singapore, will be submitted through the Science Council of Singapore to the government departments for adoption.

Upper South, Thailand

Ban Don Bay in the Gulf of Thailand and Phangnga Bay in the Andaman Sea are the main foci of planning activities in Thailand. These areas have extensive bays, coral reefs, mangroves, beaches and mudflats. Economic activities include aquaculture, tourism and fisheries.

Key issues being addressed are:

- pollution and sedimentation due to agricultural runoff and aquaculture (discharge of nutrient-rich pond water), river discharge including domestic and industrial wastes, e.g., from tin mining;
- unregulated tourism development and impact of tin mining on tourism;
- destruction of critical habitats like mangroves and coral reefs;
- overfishing and use of inappropriate fishing gear, especially push-nets;
- unregulated aquaculture development, especially clearance of mangroves, and enhancing production from mariculture activities; and
- resource use conflicts such as mining vs. tourism, commercial vs. artisanal fishing, mangrove vs. aquaculture and industrial development.

The integrated CAM plan for the Upper South covers zonation and policies for Ban Don and Phangnga Bays. Action plans to address the various management issues affecting the Upper South are the:

- fisheries resources management plan which covers sustainable utilization of the fisheries resources, control of inappropriate fishing methods, enforcement of fishing regulations, among others;
- management plan for coral reefs, beaches and island resources which is aimed at their protection, conservation and sustainable development as well as promoting environmentally compatible tourism activities beneficial to the local population;
- water quality management plan which covers water quality, pollution and sedimentation control and related issues;
- management plan for mangrove/aquaculture/land use for the sustainable development and conservation of mangroves, especially along Ban Don Bay; aquaculture industry such as shrimp farming, oyster and blood cockle culture in Ban Don Bay, and cage culture in Phangnga Bay; and zonation of resources and coastal development activities (e.g., mangrove preservation zone, aquaculture zone and agriculture zone, etc.).

The CAM plans are being formulated by the Office of the National Environment Board of the Ministry of Science and Technology. A Standing Committee composed of representatives from line agencies has been set up to oversee the formulation. The final draft plans will be submitted to the provincial government and central line agencies for implementation.

Management and Methods for Socioeconomic Analysis of Coastal Area Management. A Management and Training Workshop on *Pyrodinium* Red Tides, attended by more than 40 researchers from around the world, was held in Brunei Darussalam in May 1989. CRMP has also sponsored on-the-job trainings, medium-term academic programs and two regional workshops. In addition, directories of technical personnel, resource managers and resource management institutions have been made.

Through the collective efforts of national scientists, resource managers, administrators and the support of national political leadership, the ASEAN/US CRMP has made significant advances towards managing the region's coastal resources. Nevertheless, these efforts are only the beginning. The preparation of management plans is relatively easy compared to their implementation.

The extensive benefits derived from plan implementation will not be realized without the full support of all the stakeholders—the governments, private sectors and local communities. If this support is provided, the ASEAN region could become a model for the developing world by promoting sustainable economic development through appropriate integrated management strategies. Each participant in this conference has a unique contribution to make towards transforming this noble vision into reality. This conference provides an unprecedented opportunity for these contributions to be made most effective.

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Can these Coastal Area Management Plans be Implemented?

CAM plans, no matter how good and comprehensive they are, will be meaningless if not implemented. Through implementation, the plan could be refined such that it undergoes a process of technical and policy screening and public scrutiny. The viability or implementability of a CAM plan will depend on several factors:

1. acceptability by the government and the community at large;
2. availability of funds to implement the various schemes in the plans;
3. strong political will; and
4. institutional capability to enforce effective management measures.

Once implemented, the plan requires continuous monitoring and evaluation to address new challenges and adjust to changes.

What has the ASEAN/US Coastal Resources Management Project Achieved thus far?

The development of plans has been the major thrust of CRMP since its inception in 1986. Among the positive actions taken by each of the participating countries to implement some project recommendations are the:

- six resolutions of the Regional Development Council for Region I (Philippines);
- approval by the Thai cabinet of the mangrove management plans for Ban Don Bay with national funding of close to US\$6 million for plan implementation, and the establishment of buoys at the coral reef site in Ko Taen;
- resolution of a long-standing land use conflict at Cilacap (Indonesia);
- development and implementation of the red tide contingency plan in Brunei Darussalam; and
- decision of the State Government of Johore, Malaysia, and the provincial governments in Region I, Philippines, to integrate CAM plans into their state/regional economic development plans.

The implementation of some project recommendations is indeed good news but that of the management plans currently being developed for the six pilot sites is something that still requires a lot of effort and funds and more importantly, strong political will.

Another achievement of CRMP is its education series which promotes public education and awareness of CRM issues. For example, comic books on blast fishing and marine sanctuaries have been published in two Philippine languages, Tagalog and Cebuano. The importance of integrated CRM is stressed in the *Tropical Coastal Area Management* newsletter.

The project has also made headway in human resources development. Since 1986, seven short-term training courses have been conducted in subjects such as Information Research and Management, Principles of Coastal Resources

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Session 2: The Role of Political Leadership in Managing Coastal Resources for Sustainable Development

Building a New International Consensus

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Abstract

Worldwide climatic change, its concomitant sea level rise and their grave repercussions require an unprecedented level of international cooperation as well as a reorientation of policies and actions towards a global perspective. The following essential solutions are proposed: (1) abatement of the causes of climatic change and global warming; (2) anticipatory adaptation to imminent changes in environmental conditions; and (3) impact management. Varying capability levels among nations and the decline of global cooperation are acknowledged factors that aggravate the difficulty of a concerted action in environmental management. Disadvantaged and poor countries could gain some leverage in sustainable development through more equitable international arrangements like more liberal trade agreements and information and resource transfer. An international consensus should also be reached on the allocation of responsibilities in maintaining the earth's resources and in carrying out environment-saving strategies based on a country's wealth and capacity.

Introduction

For the past decade, scientists and political leaders have deliberated upon the issues of global warming, climatic change and its concomitant, sea level rise.

From the meetings of various United Nations agencies and other international associations, learned commissions, academic committees, workshops and seminars, more and more evidence is emerging about the intensity and the magnitude of the problems that would come in the wake of climatic change and sea level rise and also about the urgency of the need to take action.

New knowledge has emerged from all those meetings, but above all, they have pointed at the vast areas of our ignorance concerning the problems that we must tackle. For this reason, those meetings have produced recommendations for public policy only in a limited way. Many more will be needed by our political leaders and decisionmakers, faced as they are by various constraints.

All of this makes for limited capabilities on our part to implement the recommended policies within our respective nations and within the context of global cooperation. Needless to say, global cooperation is essential in dealing with global problems.

The magnitude of the problems of climatic change and sea level rise, the seriousness of their consequences and the management of the global environment require an unprecedented level of international cooperation.

We should now wonder whether our existing national and international institutions would indeed be capable of achieving and sustaining such a level of cooperation. Also, whether the recommended and needed actions in defense of the environment can indeed be made to fit into today's mainstreams of thought.

It is in this context that new orientations are needed; orientations shared by all as part of a new international consensus.

Required Efforts to Cope with Climatic Change and Sea Level Rise

What has clearly emerged from various studies is the inevitability of climatic change and sea level rise. Their anticipated ranges of magnitude and causal aspects have also been studied and identified, and it now seems certain that the momentum towards global warming and climatic change can no longer be completely arrested or reversed, but perhaps slowed down and reduced in intensity. Abatement efforts should be undertaken immediately on a global scale to reduce the causes of climatic change and global warming, especially the emission of "greenhouse gases" into the atmosphere.

Most strategies recommend the reduction of the use of fossil fuels (replacing them with alternative sources of energy) and the rate of deforestation (and increasing the rate of reforestation). The implications of such strategies are immediately apparent. They are staggering, not only in terms of costs, economic growth and development, but also in terms of the needed international agreements and cooperation.

The second set of needed actions comprise anticipatory adaptation. Anticipatory adaptation measures are largely to be taken within a nation's boundaries, and their magnitudes and expenditures will vary widely from country to country. Adaptation measures require changing our ways of treating and using the environment, such as modification of the existing infrastructure as well as

investments in new infrastructure; changes in land use and spatial planning which would further affect human settlement patterns; industrial siting; and so on.

Above all, what would be required are changes in patterns of human behavior in adjustment to environmental conditions expected to alter. These would include changes in agricultural practices, the use of new varieties of crops and the implementation of new crop cycles observing new seasonal variations and so on, involving skills and attitudes not now possessed by the farmers. Changes in attitudes and behavior--and the resulting changes in social relations--must in the end be appropriately institutionalized.

At a glance, adaptation efforts would not seem to require increased cooperation among nations. That is, if the world can condone the tremendous hardships that would befall some countries, with millions of humans affected; and if the world can abide by the collapse of entire communities and can accept an increased level of international conflict potential.

The third set would be efforts dealing with the anticipated impacts of climatic change and sea level rise. As in the case of adaptation efforts, though for different purposes, impact management efforts would require knowledge about the anticipated nature, intensity and locality of impacts. Such information on climatic change has grown considerably over the past ten years or so. What is urgently needed today is its speedier and wider dissemination.

Different countries will have greatly different levels of capabilities for impact management. The capability level will be determined by the resources at a country's disposal, its wealth, the level of skills and information it possesses, as well as by its institutional strength and the degree of integration of its society. These must now be related to a country's susceptibility to impacts as a function, for instance, of having a long coastline, dense concentrations of population along the coast and so on.

The cost of impact management will be as extremely high as the cost of anticipatory adaptation efforts. This has been demonstrated through various cost estimates by different international institutions. In such a context, the poor and developing countries will face insurmountable difficulties in making the outlays of funds, manpower, skills and other societal resources. This does not necessarily mean that the costs will be intrinsically higher in the developing countries but the difficulties lie in generating the needed funds. These countries will have to cope with the impacts of climatic change and sea level rise unless they can avail themselves of international cooperation.

International Cooperation

Unfortunately, our progress towards new levels of international cooperation has been quite slow. For instance, the nations of the world have not been able to come to an agreement on setting the desired rate of speed in reducing the emission of greenhouse gases.

As a matter of fact, international cooperation is actually declining, leaving the world more deeply mired in inertia and making concerted action for the sake of the future more and more difficult. Under such conditions, we are actually putting our entire future in jeopardy.

Today's international institutions and institutionalized arrangements may not be capable of producing the type of cooperation needed. The decline of global cooperation today is also a factor constraining the relations between the world's rich and poor countries. These relations are characterized by a persistently widening gap between the two groups of countries as resource flows continue to benefit the rich rather than the poor. Thus, the poor countries remain trapped in structural underdevelopment which puts severe constraints on their abilities to pursue development.

It also puts limits on their abilities to manage the environment for their own national sakes as well as for the sake of the entire international community. As a result, many developing countries are now being depicted as the worst perpetrators of environmental destruction and heavy pressure is being placed upon them to reduce their development activities.

What the developing countries need is the creation of conditions that would allow them to pursue a reasonable rate of development as well as to undertake environmental efforts. Or, in other words, conditions that would enable them to implement sustainable development.

This does not immediately imply the need for a massive transfer of resources from the North to the South. It implies a slowing down of the present rate of resource transfer from South to North so that a new and reasonable balance in resource flows can be achieved. It also means enabling the developing countries to generate greater value-added profit to their natural resources prior to export, the mainstay of many developing countries.

The industrialized countries must also be prepared to assume an appropriate share in the maintenance of so-called common goods that constitute part of the human heritage, such as forest reserves that are essential in maintaining weather patterns. Another example is global participation to safeguard biogenetic resources currently repositied in nature parks and reserves in the developing countries. Further in this context, once a common good--through research and development--has been developed into a new commodity and has become private property, arrangements should be made that the original repository country can reasonably share in the benefits.

In short, new arrangements need to be made regarding international marketing structures, pricing mechanisms, tariffs and nontariff barriers and so on. The need to do so has become even more urgent with the threat of climatic change and sea level rise.

It would be well within the capability of nations to make such arrangements provided they can act in concert and acquire new orientations towards their own well-being and that of all others, today and in the future. Such orientations require a willingness on the part of the industrialized countries to help create the conditions which would facilitate the efforts of the less developed countries to pursue development and environmental management. On the part of the developing countries, a readiness to fully integrate environmental considerations into

their development processes is needed. Finally, all must be willing to join efforts to keep the uses of the environment below thresholds beyond which the earth's life-support system becomes irreversibly damaged and unsustainable.

Initial Steps

Nobody harbors illusions that the task ahead of us will be easy. First, we should jointly set up an agenda of research and action leading towards information and resource sharing. This would be the basis for developing new institutional arrangements and patterns of intensified cooperation.

An example would be a new consensus on the allocation of responsibilities and efforts--to be equitably shared among nations--in carrying out strategies on abatement, adaptation and impact management pertinent to climatic change and sea level rise. Such an allocation could be based on the consideration of a country's financial wealth, the skills and knowledge at its disposal, the strength of its institutional and societal structures and also, of the magnitude of impacts to be suffered and adaptation efforts required.

A meeting could be convened to draw up the agenda mentioned above and to develop methods and means for calculating how responsibilities could be best and most equitably shared. Perhaps the members of ASEAN could take a lead and prepare a joint conceptual framework to be presented to the United Nations Conference on Environment and Development in 1992. This, I believe, would also constitute an important step towards the global implementation of the principles of sustainable development.

In conclusion, I would like to express the hope that the potentially disastrous impacts of climatic change and sea level rise, together with the perception of the widening gap between rich and poor nations, will speed up the emergence of a new international consensus. Towards that end, all of us, joining hearts and minds, need to nurture a renewed sense of community among nations and a renewed commitment towards securing a better quality of life equitably shared among all people. May we have the wisdom and the compassion to do so.

The Need for an Integrated Coastal Zone Management in the Philippines

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Abstract

The devastation wrought on the once bountiful Philippine coastal and marine ecosystems has two major culprits—high coastal population and unrestrained human activities. The absence of an effective management system and the accustomed practice of using the coastal zone as public property allow for unsustainable exploitation. Artisanal fishermen's poverty is further taken advantage of by coastal entrepreneurs who employ them and apply destructive fishing methods. Unrestricted use of the coastal waters by industry and the resultant pollution from dumped toxic and hazardous chemicals at the ultimate expense of the marginal fishermen is one of the most disparate political economic situations in the Philippines. Given these situations, the Department of Environment and Natural Resources (DENR) has recognized the necessity for integrated coastal zone management (CZM) that takes into consideration the collective relationship among coastal and other ecosystems. To this end, the department created the Coastal Resources Management Committee (CRMC) to coordinate activities towards sound planning and management for coastal development.

Horizons represent a poetic expression of the continuum of creation as the sea meets the sky. But the waves carry on the continuum to where the sea meets the land. They reach coasts which possess an undeniable charm; where a timeless geologic struggle between land and sea is witnessed. At times, the sea inundates

the continents like what happened to the fabled Atlantis, the lost continent. Sometimes, the land conquers the sea through the phenomenal geologic movements of continents. These dynamic changes in continental zones, which take thousands or millions of years, represent the first face of the nature of coastal zones. However, there is a second face. It is seen in the way man has changed the physiography of coastal zones within a time frame of years.

In order to appreciate the complexity of this intervention, one's mind's eye can follow a river's flow as it picks up the debris of deforested mountains, then on to the croplands where it gets adulterated by fertilizers and pesticides; then to the urban waterways where domestic and industrial pollution are also swept into the flow. All these are carried to the coastal zones.

Then there is a third face and this is the political economy which is the crux of CZM as it embraces the issue of resource allocation.

It is in these many faces that one can understand the coastal ecosystems and eventually address the issue of resource sustainability.

The Philippine coastal zone once represented a concentration of natural wealth, which included well-drained and fertile coastal plains, hundreds of thousands of hectares of virgin mangrove forests, extensive coral reefs and rich fisheries. This concentration of wealth, however, served as its own undoing, as it encouraged the concentration of population within the coastal zones. Because this zone now harbors about two-thirds of the Philippine population, the high population growth is the root of most of the resources management problems in these areas. There is heavy pressure on the coastal resources because of the demands of the growing number of people who seek livelihood there and the increasing levels of pollution from the industrializing urban centers in its immediate vicinity.

As such, the coastal zone presents a complex challenge in management. For the last ten years, there have been proposals for a coastal management authority. However, these have not been given due importance in the discussions of national affairs, considering that almost all government authorities, both national and local, have mandates over certain areas of the coastal zone. This chaotic situation is tantamount to an unregulated regime.

The history of the deterioration of the mangroves and the coral reefs illustrates the role of the various forces and the chain of events that determined the present conditions of these ecosystems. It is clear from these examples that the consequences of failure to define an integrated management system for these areas and their open, nonexclusive and common-property characteristics make for unsustainable exploitation.

In the early 1900s, mangroves were estimated to cover about 450,000 ha. However, recent satellite surveys indicated a residual of only about 149,400 ha. The situation in terms of change is much worse than the decline of areal coverage will indicate. In the early 1980s, extensive remote sensing and ground surveys indicated that only about 10,000 ha of old-growth, virgin mangroves were still intact. This implies that the areas seen as mangroves by a recent satellite inventory are relatively new second-growth mangroves. It is certain that because of the selective cutting of the bigger and more valuable trees, the species mix in the second-growth mangrove forests has changed significantly vis-à-vis virgin

areas. The loss, therefore, in terms of biological diversity and economic value is much greater than indicated by the loss in areal cover.

Mangrove areas, although under government jurisdiction, have assumed the nature of the commons because of the proximity of most mangroves to communities and the general lack of firm policy and supervision to regulate pressure on the resource. It was only in the 1970s when the government finally took concrete action to conserve and protect mangrove areas.

There is also extensive evidence of deterioration in other marine and terrestrial resources on which the livelihood of coastal communities depends. An important example of this is the physical and chemical damage wrought against coral reefs.

From 1979 to 1981, DENR commissioned the Marine Sciences Center (now Marine Science Institute) of the University of the Philippines to undertake a survey of coral reefs. The survey covered 632 sites all over the Philippines. It revealed that over 70% of the coral reefs has suffered considerable to major damage. This suggests that Philippine reefs are in worse condition than the average reefs in the Pacific Basin.

Both natural and man-made factors are responsible for coral degradation. There are natural predators, such as fish, echinoid grazers, worms, fungi and bacteria, that can decimate a coral reef. There are physical factors, such as natural erosion and sedimentation, excessive rainfall and the mechanical action of waves and storms. There are the effects of human interference on other related ecosystems. Sedimentation resulting from forest degradation, pollution and destructive fishing methods all have their still-unquantified toll on the coral reefs. It is safe to say, and most experts will agree, that the destruction of the corals in the Philippines is mainly due to human activities.

Because the coastal zone partakes of the nature of the commons, everyone is a potential user. However, the principal actors could be identified as:

1. the artisanal fishermen or those whose main occupation is municipal fishing, although they could be farmers during the rainy season;
2. the coastal entrepreneurs who include the fishpond, commercial fishing fleet and resort operators;
3. the coastal industries which use the water bodies as dumps for their wastes;
4. the coastal municipal governments which constantly attempt to derive income from coastal resources; and
5. the environmental advocates, mostly nongovernmental organizations (NGOs) which champion the maintenance of ecological integrity.

There are no data as to who gets the most benefits from the coastal zone. However, it is evident that the artisanal fishermen have increased in number and are among the poorest in Philippine society. The Department of Agriculture (DA) estimates that 370,000 households are dependent on municipal fishing and that their average income is below the poverty line. And yet, Philippine fisheries scientists believe that fishing effort in municipal fishing grounds is now reaching the limits of sustainability. They estimate that the total sustainable catch is somewhere between 1.45 to 1.85 million t per year and that the present annual catch is already 1.7 million t.

Artisanal fishermen are being pushed toward unsustainable fishing for a variety of reasons. One important reason is the diminishing livelihood opportunity in the coastal area due to effective privatization of the mangroves and beaches with tourism potential. About 200,000 ha of the original 450,000 ha of mangroves have been effectively privatized through long-term leases. Had these been community-operated, the income from aquaculture could have been a significant addition to the total income of the fishermen. Furthermore, it is plausible that the cutting of the mangrove swamps has had a deleterious impact on the productivity and economy of municipal fishing.

The poverty of the artisanal fishermen is further exploited by the coastal entrepreneurs. Blast fishing and the use of cyanide in capturing aquarium fish are usually financed by entrepreneurs who get an inordinate share of harvests. These two operations contribute to the deterioration of the coastal reefs and fishery stock. However, the most blatant exploitation of poverty in the coastal areas is muro-ami fishing.

Muro-ami fishing consists of groups of swimmers who carry scare lines to drive coral fish into a waiting net. The scare lines are ropes with weights which are used to pound on the corals to drive fish out of their hiding places in the corals resulting in extensive damage. A fishing boat employs about 200 to 300 youths who spend months at sea in dismal living conditions.

The impetus behind the adoption of muro-ami fishing is the high catch per unit effort it produces in a coral reef environment, ranging from 52 kg/man-hour to about 142 kg/man-hour, while yields using conventional fishing gear range from only 1/10 to 1/100 of these figures.

Aside from coral damage, the negative effects of muro-ami fishing include the nonselective capture of a large proportion of marine life, including juveniles and trash species which are corralled into the net. Thus, reefs which can be sustainably fished with traditional gear can easily be overfished using muro-ami.

Since municipal waters are already overfished, artisanal fishermen must adopt more modern technology. They must use motorized boats and other fishing equipment. However, because of the high capital costs of these equipment, many fishermen have lost their independence and now work for coastal entrepreneurs.

The role of the coastal industries in the degradation of fishing grounds is not well-documented except in a few cases. It is, therefore, difficult to say whether they play a significant role, though there are some potentially dangerous trends.

The monitoring program undertaken for Manila Bay in connection with the construction of sewerage systems indicates that water quality has deteriorated alarmingly. The bacterial count along the coast ranges from 3 to 100 times the standard set for recreational water. The concentrations of trace metals like lead, copper and cadmium are above those set for fisheries. There are also recorded oil spills, the most recent of which happened recently in a portion of Manila Bay's northern shore.

Since the coastal waters is the ultimate sink for wastes, toxic and hazardous chemicals could potentially cause the destruction of coastal fisheries and aquaculture. Because there is no effective regulatory regime, these chemicals are being discharged into drains and rivers or directly into the ocean. An analysis of the industry profile of the Philippines indicates that something like 20 to 40

million l of toxic chemicals and 80 to 150 million l of hazardous chemicals are being released into the environment annually.

The free use of the coastal waters by industry and eventual assumption of the costs of pollution by artisanal fishermen is one of the most inequitable situations in the political economy of the Philippines.

Except within the narrow circle of environmentalists, there is still little indication of the recognition of the need to establish an integrated management regime for the coastal zone. Since an institutional mechanism does not yet exist, the coastal zone will continue to be seen as a common-property resource.

Until recently, existing line agencies and local government units competed for the implementation of piecemeal approaches. Consequently, there was no effective management regime for this very important ecosystem. Under these circumstances, the free-for-all situation has persisted.

The ultimate loser is the artisanal fishermen who are trapped in a tightening circle of increasing number and poverty. At present, there is no sustained effort to control population growth. Likewise, there are no measures to absorb the excess labor in the fishing villages. Because of the weak enforcement of fishery laws, such as Presidential Decree 704, local and foreign commercial fishing fleet will continue to plunder municipal fishing grounds to the detriment of the resource itself and the welfare of the artisanal fishermen.

The present situation in the coastal zone has all the makings of an impending tragedy of the commons. However, a silver lining comes in the form of the Fisheries Sector Program for 1990-1994 launched by DA recently. This program is a comprehensive effort to attain an ecologically balanced utilization of marine resources as a basic strategy for long-term sustainable development in the fisheries sector. It has the following objectives:

1. regeneration and conservation of aquatic resources with emphasis on balancing fishing effort to maximum sustainable yield;
2. rehabilitation and protection of the coastal zone environment;
3. alleviation of poverty among municipal fishermen, particularly, through diversification of their sources of livelihood;
4. intensification of aquaculture production but within limits to maintain ecological balance; and
5. inducement of commercial fishing away from overfished nearshore waters and into the 200-mile exclusive economic zone.

The government has initiated institutional and policy reforms providing a framework for program implementation which include community-based initiatives for coastal rehabilitation; the decentralization of nearshore fisheries management to the municipal governments; the establishment of a national fisheries data information system; the rationalization of the issuance of permits and licenses; and the strengthening of fisheries law enforcement by government and NGOs. These measures are all directly related to resources management and environmental concerns. Equally important, this program also supports the policy that no more mangrove areas should be released for conversion to aquaculture.

This program will need an investment of about US\$200 million for the next five years under six different components, namely, CZM, resource and ecological assessment, research and extension, law enforcement, credit to support income diversification and infrastructure and marketing services.

The CZM component of the program will be implemented in 12 priority bays covering a total of 146 municipalities in 17 provinces. These bays were selected on the basis of resource regeneration requirements, environmental degradation problems, poverty levels and initiatives in self-regulation.

The DENR has set up a parallel program of mangrove reforestation through the National Forestation Program, which is itself supported by funding from the Asian Development Bank and the Overseas Economic Cooperation Fund of Japan. Already, the department has approved mangrove rehabilitation and reforestation projects in various parts of the country.

These moves, however, reflect only remedial measures. There remains a need for an integrated coastal management system that recognizes the relatedness of coastal ecosystems and their collective relationship with other ecosystems farther from the coast, such as the uplands.

Toward this goal, DENR created CRMC in early February 1990 to coordinate the institution and the implementation of policies that outline the protection, development and management of the coastal resources of the country. The work of the committee has resulted in the issuance of an administrative order which effectively prohibits the conversion of mangrove areas into fishponds and the establishment of fishponds in mangrove forest reserves and wilderness areas; and the inclusion of mangrove area inhabitants under the Integrated Social Forestry Program.

These developments represent the first real opportunities for the millions of coastal zone inhabitants in the many years that resources in the coastal zone have been usurped and decimated. To symbolize this hope, we can refer to the coast of Manila Bay, where one can view the splendid colors of its famous sunset. It is a hope which political will, appropriate technology and concerted effort can make real to handle the complex problems of CZM.

The Role of Environmental Protection and Coastal Resources Management in National Development Planning in Thailand

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Abstract

Thailand's accelerated economic growth has its drawbacks—overexploitation of its natural resources and land-use conflicts among various interest groups. To resolve these problems, the government's Sixth National Economic and Social Development Plan stipulates the formulation of sound economic policies based on the principle of sustainable utilization of resources. Moreover, the plan's decentralization scheme shifts the management and development of natural resources and the environment to provincial and district administrations. As a major component of the plan, coastal resources management (CRM) issues, such as mangrove forest degradation, the reduction in marine species, estuarine and coastal water pollution and the destruction of coral reefs, will be addressed. The decentralized CRM and development plan will employ: (1) existing local organizations; (2) the existing planning system to ensure that provincial and district plans are congruent with national-level plan guidelines; and (3) the macrophysical plans prepared by the central organizations. Periodic adjustments in the planning process should accommodate anticipated obstacles in its various phases of implementation.

Economic Development and Structure

At present, Thailand is considered to stand among the countries attaining great success in economic development. Thailand achieved two-digit economic

growth rates, at 11.0 and 10.46% in 1988 and 1989, respectively, which are most outstanding compared to the rates of the Overseas Economic Cooperation for Development (OECD) and other Asian countries (Table 1).

Table 1. Economic growth rates (in %) of Asian and OECD countries.

	1988	1989	1990 ^a
ASEAN	7.2 ^b	7.0 ^b	6.6 ^b
Thailand	11.0	10.4	9.0
Singapore	11.0	9.1	7.5
Philippines	6.7	5.8	6.2
Malaysia	8.1	8.3	8.7
Indonesia	4.4	6.2	6.0
Brunei Darussalam	2.2	2.5	2.5
East Asian	9.6 ^b	5.7 ^b	6.2 ^b
Hong Kong	7.3	4.5	5.0
Korea	12.2	7.0	7.0
Taiwan	7.3	6.5	6.5
China	11.4	4.8	6.4
OECD	4.2 ^b	3.5 ^b	2.4 ^b
USA	4.0	2.9	1.7
Canada	5.0	3.1	1.1
UK	3.8	2.0	2.2
West Germany	3.6	4.2	2.7
France	3.8	3.3	2.5
Italy	3.8	3.5	2.8
Japan	5.7	4.8	4.5
Australia	3.7	3.9	2.1

^aProjected.

^bAverage economic growth rate per region.

Source: National Economic and Social Development Board (NESDB) figures.

Such a good performance of economic expansion was a result of the implementation of the National Economic Development Plans since 1961.¹ During the First and Second Economic Development Plans, the construction of infrastructure (e.g., roads, dams, electricity, waterworks) was accelerated by the government to induce the expansion of investment for manufacturing, trade and service sectors. This, to date, has resulted in steadily high growth rates for the overall economy.

The exceptionally high growth rates within the Sixth National Economic and Social Development Plan period, besides being attributed to the effectiveness of economic policies previously formulated, were also due to foreign capital inflow which dramatically increased from Baht 51.43 billion in 1985 to Baht 70.29 billion

¹The First, Second, Third, Fourth, Fifth and Sixth National Economic Development Plans were in 1961-1966; 1967-1971; 1972-1976; 1977-1981; 1982-1986; and 1987-1991, respectively.

in 1988 (an increase of 36.67%).² Another important factor is that Thailand is continually transforming its economic structure towards more nonagricultural production. Industrial development policy was adjusted from import-substitution to export-promotion approaches, causing export expansion to rise from an average annual growth rate of 8.20% during 1980-1985 to 27.06% during 1986-1988. The rate was anticipated to stay at 21.77% in 1989 (Table 2).

Table 2. Changes in growth rate (in %) of exports.

Annual growth rate	1980-1985	1986-1988	1989 ^a
Nominal	8.20	27.06	21.77
Real	5.29	22.57	16.18

^aEstimates based on projection of annual value by the Bank of Thailand and Thailand Development Research Institute (TDRI) figures.

As regards sectoral production and employment, manufacturing increased its share from 22.4 to 24.4% during 1984-1988, whereas agricultural production declined from 18.0 to 16.9% (Table 3). During 1984-1988, the employment proportion in industrial, mining and quarrying, manufacturing, construction and service sectors rose from 33.8 to 36.6%, while agricultural employment declined from 66.2 to 63.4% (Table 4).

Table 3. Percentage distribution of GDP by industrial origin.

	1984	1985	1986	1987	1988
Agriculture	18.0	16.7	16.5	16.1	16.9
Mining and quarrying	3.4	4.0	3.1	3.1	3.0
Manufacturing	22.4	22.1	23.3	24.0	24.4
Construction	5.8	5.6	5.2	5.1	5.1
Electricity and water supply	1.9	2.3	2.6	2.6	2.6
Transportation and communication	7.1	7.7	7.8	7.5	7.3
Wholesale and retail trade	15.9	15.1	15.5	15.6	15.8
Banking, insurance and real estate	3.5	3.5	3.4	3.9	4.1
Ownership of dwellings	3.8	4.1	4.1	4.0	3.6
Public administration and defense	4.6	4.8	4.6	4.3	3.8
Other services	13.5	14.1	13.8	13.9	13.4
GDP	100.0	100.0	100.0	100.0	100.0

Source: NESDB figures.

²June 1990: Baht 25.77 = US\$1.00.

Table 4. Employment proportion (in %) by sector.

	1984	1985	1986	1987	1988	1989
Agriculture	66.2	66.0	65.5	64.6	63.4	61.9
Nonagriculture	33.8	34.0	34.5	35.4	36.6	38.1
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: NESDB and TDRI figures.

Despite its declining share in Gross Domestic Product (GDP), the agricultural sector is still deemed important to the economy as a whole since it accommodates 62% of the total labor force, whereas the nonagricultural sector absorbs only 38%.

That the agricultural sector with a two-thirds proportion of labor force possesses only 17% of the overall production signifies that the majority of the country's population residing in the rural areas have low productivity with income status lower than those of the other sectors. Moreover, the population of this sector have to depend on the surrounding natural resources for their livelihood and have, therefore, increased their production by expanding cultivable land through forest encroachment. The chance for the rural population to increase production by this means, however, has been diminishing over time. This is because the government sets the target to maintain forest cover at 40% of the country's total area (about 205,246 km²), of which 15% is forest preserves and 25% is productive forest (Table 5).

Table 5. Forest and cultivation areas in Thailand (unit: '000 km²).

Year	Forest area	Cultivation area
1978	175.2	186.3
1979	170.2	188.2
1980	165.5	190.4
1981	160.9	194.1
1982	156.6	197.7
1983	154.0	198.8
1984	151.5	200.5
1985	149.0	205.8
1986	146.6	207.8
1987		
1988	143.8	

Notes: The country's total area is 513,115 km². The government's targetted forest area is 40% of this total area or 205,246 km².

Source: Thailand's Department of Forestry figures.

Concepts of Natural Resources Management in the Sixth National Economic and Social Development Plan (1987-1991)

While growth of the Thai economy has been quite satisfactory, if no cautious planning is undertaken, Thailand will be inevitably confronting more and more constraints, one of which is concerned with natural resources. In the past, accelerating economic growth led to the utilization of natural resources that exceeded their carrying capacity. This resulted in problems related to ecological imbalances, as well as to conflicting uses among different interest groups, e.g., conflict between those who want forests preserved and those who need the land for farming.

The Sixth National Economic and Social Development Plan is, hence, the first plan which pinpointed an obvious objective of associating sound economic policies with the principle of sustainable resource use. Under this plan, the emphasis is on the system of natural resources and environmental management, in which the role and mission is more decentralized toward provincial and local administration. The intent is to instill a sense of belonging, active participation and public awareness among the local people and to generate continuity of long-term development.

In practice, this decentralization can be achieved through the existing planning system which incorporates the Provincial and the District Development Plans prepared by their respective committees. Since the concepts of natural resources and environmental development were just recently introduced to the provincial and district levels, a sub-committee and a task force have been set up and assigned to take charge of formulating guidelines and plans at the provincial and district levels, respectively. These plans will be included as part of the Provincial and the District Development Plans.

At the initial stage, development activities which will be carried out by provincial and district administrations are those which have never been done by the central organizations and which have the work scope suitable to the capabilities of the administrations, as for example:

- maintenance of preservation areas within the province and district;
- management of public lands within the province and district;
- management of the cultural heritage environment; and
- creating public awareness among the local people.

Before being introduced to all provinces and districts throughout the country, the concept of decentralization of natural resources management was first experimented in three selected provinces. The evaluation was subsequently submitted to the Cabinet. On 7 February 1989, decentralization was approved for implementation to cover all 73 provinces, with the budget allocated through the Ministry of Interior.

Decentralization will not, in the least, affect the mission of the central organizations. On the contrary, it will make the system of management and administration complete and more efficient as part of the work in the local areas may not be thoroughly regulated by the central organizations. In the near future, regional

universities will also be encouraged to take part in and give academic assistance to the provincial-level natural resources management schemes.

Coastal Resources Management in Thailand

Thailand has a total land area of 513,115 km², with 2,960 km of coastline. There are 23 out of the total 73 provinces having coastal areas. Since coastal resources have been increasingly utilized for several economic activities, two problems have been evident, i.e., overexploitation and conflicting uses among different interest groups.

The most evident case of overexploitation is that of mangrove forests which, during the past 25 years (1961-1986), have been reduced by a total of 880 km², a decline of about 25% (Table 6). The main conversions of mangrove forests have been to aquaculture, mining, salt pond construction, agriculture, urbanization and development of industrial sites and harbors (Table 7). As a result of such conversions, the total fish catch in many mangrove and estuarine areas is decreasing, which has an adverse effect on the livelihood of artisanal fishermen.

Table 6. Degradation of mangrove forests in Thailand.

Year	Mangrove forests km ²	Degraded area		Degradation rate	
		km ²	%	km ² /yr	%
1961	3,567.00	-	-	-	-
1975	3,127.32	439.68	12.3	31.41	0.9
1979	2,873.08	254.24	8.1	63.56	2.0
1986	2,686.94	186.14	6.5	26.59	0.9
		880.06	24.7	35.20	1.0

Source: TDRI figures.

Table 7. Conversion of mangrove areas (km²) to other land uses.

Land-use type	Before 1980	Between 1980-1986	Total	%
Aquaculture	260.36	119.57	379.93	38.3
Mining	9.26	45.25	54.51	5.5
Salt ponds	105.60	-	105.60	10.6
Others	318.69	21.33	340.02	45.6
Agriculture	-	(7.02)	-	-
Urbanization	-	(7.35)	-	-
Industrial sites	-	(1.82)	-	-
Harbors	-	(5.14)	-	-
Total	693.91	186.15	880.06	100.0

Source: TDRI figures.

The decrease in the number of marine species is also attributed to water pollution resulting from mining and other industrial activities.

The amount of total marine fish catch in Thailand has been constant since the 1980s. Although the catch rose slightly in 1986 and 1987, the scarcity of marine fish has been increasingly apparent because the fish catch per unit effort (CPUE) (as measured in kg/hour) has been declining over time (Table 8).

Table 8. Marine fish catch and CPUE.

Year	Marine catch (million t)	CPUE (kg/hour)
1961	0.23	297.6
1970	1.33	137.0
1980	1.65	62.0
1981	1.82	49.8
1982	2.99	49.2
1983	2.10	45.7
1984	1.97	60.1
1985	2.06	54.0
1986	2.35	49.4
1987	2.60	n.a.
1988	2.68	n.a.

Note: n.a. - not available.

Source: Thailand's Department of Fisheries figures.

One of the issues of public concern is water pollution. Some estuarine and coastal waters have been polluted as a consequence of development activities, specially tourism industry and urbanization. To accommodate the growing towns and cities, a large number of commercial buildings, housing units and hotels have been extensively constructed and these have discharged a substantial quantity of wastewater. According to a study by the Office of the National Environment Board (ONEB), the estuaries of Chao Phraya and Thachin Rivers are now characterized by relatively low dissolved oxygen. Other estuaries also show evidence of some pollution. However, the levels of dissolved oxygen are high along the East Coast of the Gulf of Thailand, indicating that the current organic load discharged from the major rivers is being assimilated quickly into the marine environment.

Despite their importance to fisheries, recreation, tourism and research, coral reefs in many places are being destroyed by fish dynamiting, ship anchorage and harvesting for souvenir and ornamental purposes. The problem is partly due to the people's lack of understanding and awareness of the ecological value of coral reefs. Nonetheless, protecting coral reefs from destruction caused by physical problems is actually less difficult than protecting them from destruction caused by water quality problems.

At present, Thailand has a total of 14 national marine parks which, apart from their natural beauty for recreation and tourism, are important for research and education and for providing the wildlife habitats. Some of the national marine parks (Table 9) of international stature include Mu Ko Surin, Mu Ko Similan and

Tarutao. The recent declaration to establish national marine parks is a good initiative by the government. However, an important consideration is how to efficiently manage and maintain these parks to achieve its objectives. It is proposed that the government give financial assistance to the Department of Forestry in preparing an on-site management plan for each marine park.

Table 9. National marine parks in Thailand.

Name	Province	Area (km ²)
1. Khao Sam Roi Yod	Prachuap Kirikhan	98.08
2. Tarutao	Satun	1,490.00
3. Mu Ko Ang Thong	Surat Thani	102.00
4. Ao Phangnga	Phangnga	400.00
5. Mu Ko Surin	Phangnga	135.00
6. Hat Nai Yang	Phuket	90.00
7. Khao Laem Yah	Rayong	131.00
8. Hat Chao Mai	Trang	230.00
9. Mu Ko Similan	Phangnga	128.00
10. Mu Ko Chang	Trat	650.00
11. Laem Son	Phangnga, Ranong	315.00
12. Hat Nopharatthara	Krabi	389.98
13. Mu Ko Phatra	Trang-Satun	494.38
14. Khao Lum Pee	Phangnga	72.00

Source: Department of Forestry.

Guidelines for coastal resources management

Before the Sixth National Economic and Social Development Plan, there had never been any management plans designed for the coastal zone. Following the recognition of the coastal resources system as an important production base which has been increasingly degraded, the need to formulate policy to effectively manage the coastal resources becomes apparent.

The coastal area management (CAM) plan has three main guidelines.

First, the system of decentralization and the efficiency of CRM will be enhanced by making use of the existing agencies concerned, without creating any new ones. Previously, the management and maintenance of coastal resources was primarily the function of central organizations, for instance: the Department of Forestry was in charge of mangrove and marine parks; the Department of Fisheries, of fisheries resources; and the Department of Mineral Resources, of minerals. The Sixth Development Plan, therefore, has to address the issue of decentralization.

Since Thailand has already developed an efficient system of planning at all levels--national, provincial and district, the second guideline is that this system be used for implementation and coordination. The CAM plan is to be prepared

by the provincial administration and be a part of the natural resources management plan which itself forms an integral part of the provincial development plan. The same procedure is applied at the district level. The district level plans, when summed up, become the provincial level plan. Both plans have to be in consonance with the guidelines set in the national level plan.

Third, the macrophysical plans, furnished by the central organizations, will be used for CAM. For instance, the land-use classification plan prepared by the Department of Land Development can be used to identify what part of coastal land should be allocated for preservation, conservation and development zones. The mangrove land-use zoning plan prepared by the Department of Forestry specifies what parts of mangrove land should be set for preservation and economic zones I and II.³ The Department of Forestry has also provided management plans for each of the national marine parks. These parks are zoned for various objectives; operation procedures as well as coordination methods are clearly stated.

The ONEB, as a central planning body, coordinates with the coastal cities to work out solutions to environmental problems and provides technical advice and assistance whenever required.

Conclusion

Thailand's past performance of economic development has been impressive, in particular, in terms of economic growth having gained steadily and substantially high rates since the First through the Sixth National Economic and Social Development Plans. The successful economic development, however, has been based on exploitation, to a full extent, of the nation's natural resources, irrespective of their limits. Deterioration of environmental quality and depletion of most natural resources are serious. Such problems, if no remedial actions are undertaken, would become a major impediment to socioeconomic development in the future.

Therefore, natural resources management planning is necessary to bring about development sustainability. Since the implementation of this concept is in its initial stage, there may be problems and obstacles to overcome. Thus, periodic adjustments in the planning process are required.

³The three types of mangrove land-use zoning approved by the Cabinet on 15 December 1987 are as follows:

1. preservation zones which cover the parts of mangrove areas permanently preserved and prohibit any land-use changes, i.e., the natural conditions are to be maintained for ecological balance;
2. economic zones I which cover the parts of mangrove areas allowed to be commercially utilized, e.g., wood and charcoal production through concessions; and
3. economic zones II which cover the parts of mangrove areas allowed to be converted for agricultural purposes (farming, livestock, fisheries and salt ponds), industrial activities (mining and manufacturing) and other uses (e.g., community centers, commercial areas and ports).

Reconciling Economic Development with Environmental Protection in Malaysia

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Abstract

The recent economic boom in Malaysia and the substantial increase in the export of its manufactured goods manifest its shift from an agro-based to an industrialized economy. Nonetheless, the country still relies on its natural resources to sustain economic growth. Thus, its environmental policies, regulations and programs have attempted a balance between economic development and environmental protection. For example, Malaysia has ventured into indigenous technologies for agricultural and industrial waste management and recycling, as well as pollution control. The mandatory environmental impact assessment (EIA) review for all major development projects by a multisectoral body is another effective and beneficial scheme successfully implemented in the country. Financial constraints to environmental projects, on the other hand, could be eased by more innovative arrangements between donor countries/agencies and developing countries.

Before I speak on the topic of reconciling economic development with environmental protection in Malaysia, please allow me to give a brief account of the country's present economic growth. The recovery of the Malaysian economy from its slump in the mid-1980s has even surpassed our forecasters' optimistic

projections. Our Gross Domestic Product (GDP) has risen from 4.7% in 1987 to an estimated 6.5% last year.

Much of our growth has occurred in the manufacturing sector where almost 50% of our private sector investment is now being channelled. This rise in manufacturing is contributing to increases in our exports. At the beginning of the 1980s, manufactured goods accounted for only 20% of our total exports. By 1988, this figure more than doubled and was worth US\$7.65 billion. In 1990, an estimated 50% of our total exports came from our manufacturing industries. Manufacturing is, therefore, growing in Malaysia and we will continue to promote this sector of our economy as we are not prepared to remain "hewers of wood and drawers of water" for the world. Malaysia does not intend to remain a mere provider of raw materials for the industries of the developed world nor be subjected to the vagaries of market forces of the global economy. Our industrialization program is aimed at uplifting our economy, which has been largely agro-based, to that which will give added value to our products.

Nevertheless, we are still a nation that depends on its natural resources for our continued economic growth and development. We export annually some US\$8 billion of crude petroleum, \$2.4 billion in sawn timber and logs, \$1.5 billion in rubber, \$1.2 billion in palm oil and \$320 million in tin.

Natural resources exploitation also provides raw materials for industries essential to Malaysia's economy. Many of these industries are based along our coastlines. Malaysia's continued economic growth is inextricably linked to a unique relationship among industry, natural resources and coastal areas. In this light, it was naturally prudent that we formulated environmental policies to protect our natural resources which form part of our national heritage.

Our government has long recognized the critical value of our natural resources to our economy and our people. The resources, particularly those found along the coastlines, are not only invaluable, but also vulnerable to both pollution and overexploitation.

Other than being prepared for the imminent threat of pollution arising from vessel sources and tanker accidents, the government of Malaysia has also taken early measures to curb the impact of pollution from land-based sources, particularly, the palm oil and rubber industries. These industries, once considered the most polluting of all, are now contributing 4% or less of the total organic pollution load in the receiving riverine and coastal waters of Malaysia. The successful control of these sources of pollution has been a result not only of the strict enforcement of regulations made in 1978 under the Environmental Quality Act of 1974, but also of research and development investments (induced by the enforced law and regulations) in the treatment, recovery and disposal of both palm oil and rubber effluents. Malaysia is willing to share its indigenous technology for the management of agro-based and industrial wastes with all concerned or interested. We are encouraging our industries to apply "zero waste" technologies, and also to utilize and recycle the wastes for other uses. For instance, our palm oil mills are able to utilize the fruit fiber to generate electricity by incineration, the ash after incineration for fertilizers, and Vitamin E extracted from the palm fronds.

Another case in point is Ajinomoto Malaysia Private Limited which turns its wastes into good quality fertilizers. The capital costs incurred by the company for the acquisition of equipment and technology were recovered within three years.

We will continue to rely on new technologies for our industrial activities in order to reduce environmental pollution. This is an area that we will be concentrating on.

Although Malaysia has made some progress in controlling its water pollution from major sources, pollution from untreated or partially treated sewage remains to be overcome in many communities. Sewerage master plans and feasibility studies have been completed for practically all major towns; however, most of these remain to be reviewed and implemented. A major drawback in the sewerage development program is not only the lack of financial resources of the local authorities which are responsible for these services, but also their inability to service the conventional mode of loan packaging and financing. At this juncture, I would like to call the attention of multilateral financial institutions like the World Bank and the Asian Development Bank to explore the prospects of more innovative approaches to financing environmental projects in developing countries. Other than debt-for-nature swap schemes with donor countries or agencies, such agencies could reconsider "rechannelling part of the debt-service amount" to environmental projects like sewerage. For instance, Malaysia is one of those countries that has to pay very high interest rates for infrastructure project loans including sewerage schemes. Perhaps, part of the loan repayments could be waived or the interest rates reduced.

Malaysia has also instituted other programs that promote environmentally sound projects. Under the 1985 Amendment to the Environmental Quality Act of 1974, I have prescribed 19 major categories of activities, largely coastal, that are subject to EIA, after consulting the Environmental Quality Council (EQC). The council is an advisory body of representatives from both the public and private sectors or interest groups. Members of the EQC represent all interests, including both economic and environmental concerns, so that these issues can be adequately addressed and reconciled. Review panels, consisting of relevant experts from the government, the industry and the academic institutions, review critically every detailed EIA report submitted to the Department of Environment. Such an arrangement reflects an effort to reconcile the views of the private sector with those of the concerned public.

Our brief experience in the implementation of the mandatory EIA procedure in Malaysia since April 1988 has been very encouraging and rewarding. It has proven to be an effective mechanism that inculcates the value of integrating the environmental dimension into project planning and implementation by both private and public sectors. The requirement does not in any way delay the overall project planning or implementation, particularly when proponents take into account environmental considerations early in their conceptualization and planning. In fact, the limited exercise has proven to be beneficial to the project proponents themselves, in saving the otherwise unnecessary heavy investments in pollution control measures, simply because of poor siting decisions taken without the earlier benefits of EIA studies. EIA has also provided useful

guidance for proponents to locate their projects at the most suitable sites with little mitigating measures required.

Our efforts have been well-complemented by the recent policy change of not only the multilateral funding agencies, but also that of private banks. The EIA report has to be cleared first by the environmental authority prior to the finalization of any loan or other financial arrangements between lending agencies and project proponents. Such an informal administrative arrangement in the banking world has helped enforce the implementation of the EIA procedure in Malaysia. I hope such an arrangement could be formalized so as not to disrupt the implementation schedule of ongoing projects.

In short, Malaysia has embarked successfully in both controlling and preventing environmental problems from arising at an early stage. Efforts are made to enhance environmental awareness and responsibility in the industries from the supervisor at the shop floor to the executive level by inculcating in them that they are all "environmental managers". We do not claim to have been completely successful, but we share our story so that our ASEAN colleagues may guide us on how to enhance the quality of life in the region, based on their own experience. Close cooperation among us is essential.

Therefore, environmental improvement projects and environmental planning such as that which has been initiated at the regional level, namely, the ASEAN/US Coastal Resources Management Project, are welcome. This approach, I believe, will further strengthen our efforts not only to reconcile economic growth with environmental concerns, but also to ensure that our present and future development could be maintained on a sustainable basis.

Session 3: Providing Resources for Sustainable Development

Evolution of the World Bank's Environmental Policy

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Abstract

Global environmental degradation and the recognition of the fundamental importance of sound environmental management to economic development gave the World Bank the impetus to modify its traditional approach to environmental issues. Thus, the bank's new policies effected organizational changes and integrated environmental considerations into all aspects of its operations. These are increasingly evident in its country and regional environmental studies; project and sector loans; and policy, research and evaluation activities. The bank's efforts in country economic work aim towards a systematic analysis of environmental problems and their causes. Strategic issues that remain to be addressed include reconciling economic with environmental criteria in economic policymaking, the "global commons" problems and political constraints.

Introduction

The World Bank (WB) has been formally concerned with environmental issues for about 20 years, having recruited its first environmental adviser in 1969 and established an Office of Environmental Affairs shortly thereafter. Although in many ways it played a leadership role in this area, rapidly unfolding events over the past two decades were not matched in the bank either in terms of the degree of effort devoted to environmental matters, or in the approaches actually used.

A number of WB lending operations, such as the Polonoroeste Project in Brazil, and the Botswana Livestock and Indonesia Transmigration Projects, have in recent years been the subject of intense public criticism. This, combined with increasing evidence that environmental degradation in its many forms, including deforestation, soil erosion and pollution of water resources and the atmosphere, constitutes a genuine threat to economic development, has prompted the bank to adjust its policies toward environmental management.

The general views of the bank have been expressed in a report to the Development Committee for its April 1987 meeting. This report (Warford 1987), drawing upon lessons from bank experience, recognized that environmental issues were becoming increasingly important in macroeconomic terms. It also emphasized that because of the pervasive nature of environmental problems, the traditional project-by-project approach, while important and deserving of more effort, needed to be supplemented by the integration of environmental management into economic policymaking at all levels of government. It concluded that special attention should be given to the design of economic incentives to induce environmentally sound behavior, and provided examples of economic policies that satisfied both economic and environmental objectives.

One year later, the bank reported to the Development Committee on the measures it had taken to reflect the foregoing in its own operations. This report (Warford and Ackermann 1988) described organizational changes—essentially the creation of the Environment Department (ED) and the four Regional Environment Divisions—an increase in environmental staff, and the various instruments developed to integrate environmental considerations into the bank's work.

The paper also set out the key environmental issues of concern to the bank: deforestation, biodiversity, watershed degradation, desertification, pesticide management, industrial disasters and urban pollution.

Recognizing that sound environmental management is fundamental to the development process, the thrust of the bank's new policy is on integration—to make environmental issues part and parcel of the way that all staff view their work. In practice, environmental considerations are now being addressed through a continuum of activities that range from a series of country environmental studies to country economic and sector work, project and sector lending and evaluation. Progress in integrating the environment throughout the bank's operations, as outlined below, is described more fully in yet a third report to the Development Committee for its September 1989 meeting (Warford and Partow 1989).

Country Environmental Studies

More explicit consideration of environmental issues in country programming and the economic policy dialogue are being assisted by *environmental issues papers* (EIPs). These have now been prepared for nearly all of the bank's borrowing

countries to heighten awareness of environmental issues, to delineate responsibility for addressing them in country operations and to achieve a consistent approach to their solution. For use as internal discussion documents for project, sector and macroeconomic work, the papers identify key environmental problems, such as population pressure on resources and legal and policy constraints and their underlying causes. Common themes are perverse economic incentives, insecurity about property rights and the lack of institutional capacity to tackle major problems.

Environmental action plans, which are in concept the next step after EIPs, take a variety of forms. For the smaller countries, they can cover a wide spectrum of activities, providing a framework for integrating environmental considerations into a nation's overall economic and social development programs. Such plans are intended to outline the environmental policies, investment strategies, legislation and institutional arrangements required. Work on overall country plans is at an advanced stage for Madagascar, Lesotho and Mauritius, while those for Rwanda, Ghana, Burkina Faso and Guinea are in the early stages of preparation.

Other studies are employing the greater selectivity required to address environmental issues in larger countries or, where for some other reason, more in-depth treatment is required. Examples include major studies in Nepal, Philippines and Indonesia, all of which focus on the multiple causes of deforestation and poor watershed management and make major policy recommendations. A study of the underlying causes of tropical deforestation in Brazil (Mahar 1989) provides a classic example of the way in which economic analysis can be used to identify appropriate environmental policies. This analysis shows that a range of government policies such as subsidies to cattle ranching, various tax incentives and allocation of property rights are major underlying causes of deforestation in the Amazon.

Several *regional studies* are also under preparation. The largest is the Environmental Program for the Mediterranean, funded jointly with the European Investment Bank. Others include the Capital Cities Clean-up Project for the Asian region and a study of the role of geographic information in renewable resources management in Sub-Saharan Africa.

Environment in Country Economic Work

The increasing concern for the environment, exemplified by the studies referred to above, is only just beginning to be reflected in country economic work. Of the 28 policy framework papers completed last year, 20 referred to environmental and natural resources issues, but the depth of analysis varied considerably, most papers discussing such issues only superficially. Brief references to forestry problems, energy efficiency and population pressure on natural resources were frequently made, but in only two cases—Madagascar and Nepal—did environmental issues receive substantial attention.

A review of country economic reports completed last year revealed a similar pattern. A few of them made policy recommendations for such things as institutional reform, grazing fee schemes, and energy conservation, but in most cases,

reference to the environment was superficial. Exceptions included reports on Costa Rica, Mauritius and the Philippines, all of which built the conclusions from substantial environmental work into the country economic analysis. Other than these examples, however, there have been few efforts to trace the likely consequences of resource degradation on sustainable economic growth or to identify economic policy measures to deal with environmental problems.

Lending Operations

Project and sector lending

Last year, over a third of the bank's loans contained significant environmental components (see Table 1). The growing concern for the environment will be even more evident in future lending operations. Whereas in fiscal year 1989, two

Table 1. WB loans with environmental elements, by sector, for fiscal year 1989.

	Total loans	Loans with environmental elements	Percent of total
Agriculture and rural development	51	39	76
Forestry	3	3	100
Irrigation and drainage	5	5	100
Area development	10	9	90
Research and extension	10	8	80
Agro-industry	5	2	40
Others	18	12	67
Energy	23	12	52
Oil, gas and coal	6	4	67
Power	17	8	47
Transportation	22	7	32
Water supply and sewerage	10	7	70
Industry	14	5	36
Industrial development			
finance	16	3	19
Small-scale industry	5	1	20
Urbanization	12	3	25
Telecommunications	7	0	0
Education	19	2	11
Population, health and nutrition	12	2	17
Technical assistance	13	0	0
Nonproject	21	4	19
Structural adjustment	14	4	29
Others	7	0	0
Total	225	85	38

projects had primarily environmental objectives (a watershed management project in Nepal and a forestry project in Ghana), there are about 30 major environmental projects in the pipeline for the following three-year period. These include 11 forestry projects, all of which contain environmental elements and ten general environmental and natural resources management projects with such elements as pollution control, tribal protection, reforestation, fisheries, land use surveys and the development of institutional and incentive structures for sustainable resources use. Two large projects for integrated watershed development are also under preparation, as are loans and credits targeting resettlement, flood control, water supply, industrial energy conservation and area development and protection.

A wide range of environmental issues was addressed in fiscal year 1989 lending. About three-quarters of the bank's agricultural/forestry loans contained environmental components. These included land and soil management and conservation, integrated pest management techniques, wildlife management, forest protection and management, drainage and irrigation rehabilitation, institutional support and research.

More than half of the bank's energy and power projects approved in fiscal year 1989 had environmental elements ranging from provisions for environmental impact studies to explicit environmental objectives. The diversity of environmental issues in this sector is vast: atmospheric pollution, global warming, local air and water pollution, hydropower and resettlement problems and the trade-offs among renewable and nonrenewable energy sources and conservation. As in previous years, almost all energy projects had loan conditions to improve pricing policy and thereby enhance efficiency in energy consumption.

Environmental concerns were also frequently addressed in lending for other sectors, particularly industry, transportation and water and sewerage. Population is fundamental to most environmental problems and the bank has continued to give its population work high priority. The International Finance Corporation is also devoting increasing attention to the environmental consequences of its projects.

Structural adjustment loans

Adjustment lending has not, until recently, paid explicit attention to environmental issues. But it does not follow that the consequences of this omission have necessarily been adverse. Indeed, in many cases, good economics is good for the environment; long-term economic and social objectives can often be well-served by short-term adjustment policies. For example, such structural reforms as reduced government subsidies for energy, pesticides and irrigation water are typically environmentally benign. Other adjustment policies--to reduce government intervention in marketing arrangements or to revalue the exchange rate--may have a profound and conceptually traceable impact on the environment. Such policies, by changing agricultural prices, influence the types of agricultural activity conducted, with consequent environmental implications.

There is some evidence that price reforms have encouraged the production of environmentally benign export crops in some countries, but generalizations about the overall impact of past adjustment lending on the environment are difficult to make. Apparently, identical loan conditions may have dramatically different impacts in different countries, depending on the prevailing institutional arrangements, the prices of other goods and the physical and cultural environment. Where the potential environmental impact of adjustment lending is clearly significant, the government decisionmaker, and the bank country economist, should wherever possible make the effort to anticipate that impact and to adjust the proposed policy intervention accordingly.

Adjustment lending in fiscal year 1989 illustrates a growing recognition of the potential of structural reforms in achieving environmental objectives. Of the 14 structural adjustment loans approved in fiscal year 1989, four explicitly address environmental objectives or issues--Ghana (natural resources management), Gambia (agriculture and environment), Guinea-Bissau (forestry) and Laos (forestry). Several other loans incorporate conditions likely to have positive environmental implications.

Although environmental concerns are not specifically addressed in most of the other structural adjustment loans, several of them include conditions that are likely to help the environment. These include reducing or gradually eliminating pesticide subsidies; reforming energy prices to reflect the economic costs of supply; studying interfuel substitution to develop strategies for meeting energy demand via biomass and commercial energy sources; improving the security of land tenure; and increasing the participation of farmers in the operation and maintenance of irrigation schemes.

Policy, Research and Evaluation

The ED's policy and research activities encompass three main areas--natural resources management, environmental quality and health, and environmental economics. Natural resources management includes research and development of policies in tropical forestry, biodiversity, drylands management, watershed management, wetlands and irrigation and salinity. Work on geographic information systems in economic and environmental management also falls under this category. Environmental quality and health comprise such issues as industrial pollution, air quality management, global climate change, alternative energy sources, industrial risk, natural hazards and the relationship between public policies and environmental health. Environmental economics and institutions focus on considering the environment in agricultural pricing, power system planning, national income accounts and economic analysis for projects; integrating the environment into general development economics; and designing management systems and institutions to address environmental issues.

Evidence of the degree of integration taking place is that other sector departments conduct more environmental policy and research work than ED

itself does. Particular attention is paid to the environment in the Industry and Energy Department, and environment is a pervasive theme in its Energy Sector Management Assistance Program, in which conservation and efficiency issues predominate. Environment is also a major theme of the policy and research program of the Agriculture and Rural Development Department, and, to a lesser extent, of the other sector departments in the bank's policy and research complex. However, the emphasis on population, as well as on other programs such as women's issues and primary health care that directly affect it, gives the work program of the Population and Human Resources Department a central role in the bank's overall environmental effort.

The Operations Evaluation Department now routinely addresses the environmental consequences of bank projects, and its annual report for fiscal year 1989 stresses the critical role of country economists and of structural adjustment lending in dealing with environmental problems.

Strategic Issues

Although the process of integrating the environment into the bank's day-to-day operations has been good, a number of strategic issues remain to be faced. These include the conceptual and practical problems involved in bringing environmental management into the mainstream of economic policymaking; the special problem of the "global commons"; and political constraints.

Economic policy and environmental management

Sound economic policies require a better understanding of the social and economic significance of environmental degradation. Valuation difficulties can create a bias against environmental projects or conservation measures. Means must be devised to ensure that nonmonetary values are systematically built into the decisionmaking process, whether it relates to project justification or to macroeconomic policy. Efforts are being made in the bank to address this highly contentious issue.

Better understanding is also required of the chain of causality leading to severe environmental problems in order that remedial policies can be identified. This is often difficult because of the complex interactions between natural events and human activities that characterize the environmental problem. To improve its knowledge in this area, the bank is investigating the relationships between geographic data, including remote sensing, and various kinds of socioeconomic data. The purpose is to see if recent advances in the processing of geographic information can be used to identify the impact of such changes in economic and social variables as population growth, poverty or pricing of key agricultural commodities to form the basis for policy intervention.

A need also exists to stimulate awareness of the macroeconomic importance of environmental problems. The shortcomings of national income accounts in their treatment of environment are fairly well known—for example, pollution abatement costs are counted as additions to national income. Of special relevance to many developing countries is that there is typically no accounting for the reduction of the stock of those resources, that, in principle, are renewable, but which, in practice, because of overexploitation, are rapidly being depleted (Ahmad et al. 1989). If compensating investment is not made, growth based on such a process is not sustainable, and conventional national income measures provide a misleadingly favorable impression of economic progress.

Treating natural capital depletion in a similar manner as depreciation of man-made capital would provide a more realistic indicator of economic progress. The bank is planning to conduct a series of country studies to create an awareness of environmental issues at the macroeconomic level, and, equally important, to identify areas where sound policies require more information.

Although research in these and other areas is required, information deficiencies should not be an obstacle to action. Economic techniques exist—and for most countries, so does natural resources information—to substantially improve the way that environmental degradation is handled in country economic planning. The bank's country economic work will increasingly focus upon: (1) the extent to which national income accounts would be affected if environment is accounted for properly; (2) the extent to which environmental degradation threatens sustainable economic growth and country creditworthiness; (3) prioritization of environmental problems; and (4) identification of economic policies to address environmental issues.

The "global commons" problems

Air and water pollution on an international scale—in the form of acid rain, global warming, threats to the ozone layer and pollution of the seas—reflect the growing physical and economic interdependence among nations. Although certain developing countries are contributing to the problem through emission of industrial pollutants and tropical deforestation, primary responsibility continues to rest on the industrialized countries. For example, while they have about 11% of the world's population, they are responsible for over 90% of the industrial emission of carbon dioxide into the atmosphere. The bank will continue to urge the industrialized countries to improve their environmental policies through its participation in international conferences such as those on global warming, transboundary shipment of toxic wastes and the ozone layer.

With regard to its borrowing countries, the bank addresses global commons issues in a number of ways. One is its involvement in regional activities, the Environmental Program for the Mediterranean perhaps being the best example, another being the studies of the common desertification problems of Sub-Saharan Africa. The bank also supports individual projects and policies with primarily environmental objectives, and ensures that others contain the required

safeguards. Improvement of the local environment will typically be consistent with global objectives.

Energy conservation is an area that had been given considerable attention by the bank in the past, and which, because of increasing environmental threats, such as global warming, will become still more important in the future. Efficient pricing policies that reflect true economic costs of supply, including environmental damage, as well as efforts to ensure that borrowers use efficient conservation measures, will continue to be central to the bank's energy policy. Efforts will have to be made to increase cost recovery targets and to improve the poor record of compliance with loan conditions relating to tariffs and cost recovery. It will also be necessary to continue the search for projects and policies that meet both economic and environmental criteria in less traditional ways: a newly emerging priority is the identification of opportunities for funding alternatives to chlorofluorocarbons. More generally, the bank must assist governments in developing patterns of growth that are substantially different from the industrialized country model. Every opportunity should be taken to ensure that renewable and nonrenewable resources are efficiently managed; in particular, prospects for continued economic growth in the developing world will depend heavily on avoidance of the energy intensity that has characterized development in the industrialized countries.

The bank has limited ability to persuade borrowers to invest in environmental improvement measures when the benefits accrue outside their national borders. This applies to measures that reduce the direct export of pollutants, and to the preservation of a unique indigenous species that may be primarily of international concern. In such cases, borrowing at commercial rates may not be acceptable; for this reason, the development community is currently considering alternative forms of subsidized funding mechanisms for environmental protection.

Political constraints

The bank's environmental strategy has been broadened from a focus on individual projects to include a concern for macroeconomic causes and prescriptions. This represents a major change in approach, but even more fundamental causes of the environmental problem need attention and inevitably involve politically sensitive questions about the distribution of land, income and wealth, and of political and institutional power (Foy and Daly 1989). By their nature, environmental problems typically involve conflicts of interest: the upstream polluter damages downstream fisheries; mining or logging operations threaten indigenous tribes; deforestation threatens the global climate; urgent present-day needs threaten the well-being of future generations. In most cases, the powerful damage the weak or those who have little say in the decisionmaking process. Vested interests are therefore a powerful constraint, and strong political will is required. Against this background, it is to be expected that governments, the bank and other external agencies will encounter increasing resistance in trying to deal with the environment.

Conclusion

The bank's approach to the environment recognizes that its traditional concern for the environmental consequences of individual projects must be accompanied by the integration of environment into all aspects of its operations. This process is taking place, but a major effort is needed to accelerate it, particularly with regard to country economic work. A major objective of the bank's environmental effort in the period ahead will be to encourage systematic analysis of environmental issues as part of its normal country economic work. To this end, improved understanding of the fundamental causes of environmental problems, methods of evaluating those problems and ways of addressing global commons and political constraints will be sought. The task ahead is enormous, but the severity of the problems more than justifies the effort.

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The Asian Development Bank's Efforts in Sustainable Development of Coastal Resources

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Abstract

The Asian Development Bank (ADB) is committed to promote socioeconomic progress that is supportive of the environmental concerns of its developing member-countries (DMCs). It has established a framework of policies and procedures which effectively integrates critical environmental considerations into its overall objectives and strategies. Environmental planning techniques are employed by the bank through country programming and strategy studies; project review and monitoring; research and training activities; and cooperation with nongovernmental organizations (NGOs) and other development agencies. The environmental policy of the bank emphasizes institutional strengthening and favors the attainment of long-term program loan objectives. The Fisheries Sector Program (FSP) loan extended to the Philippine government is cited as an example that demonstrates the bank's intersectoral and multidisciplinary approach to development planning, in this case, coastal resources management (CRM). FSP's intended benefits are principally social and environmental in nature, supplemented with sustainable production; improved diversity, quality and productivity; and augmented foreign exchange earnings through increased exports.

Role of the Bank in the Region

An international partnership of 47 member-countries, ADB is engaged in promoting the economic and social progress of its DMCs in the Asia-Pacific region.

In its 23 years of operations, the bank has become a major catalyst in promoting the development of the most populous and fastest-growing region in the world today. The bank's principal functions are: (1) to make loans and equity investments for the economic and social advancement of DMCs; (2) to provide technical assistance for the preparation and execution of development projects and programs and advisory services; (3) to promote investment of public and private capital for development purposes; and (4) to respond to requests for assistance in coordinating development policies and plans of member-countries.

In its operations, the bank is also required to give special attention to the needs of the smaller or less developed countries and give priority to regional, subregional and national projects and programs which will contribute to the harmonious economic growth of the region as a whole. The bank is also committed to promote environmentally sound economic development when it became signatory in February 1980 to the Declaration of Environmental Policies and Procedures Relating to Economic Development.

Environmental Policies and Procedures

A working policy paper, "Review of the bank's environmental policies and procedures," endorsed by the bank's board in 1986 provides the framework of action on environmental matters. Generally, environmental considerations are to be safeguarded through: (1) project review to ensure that potentially significant environmental effects are identified and appropriate measures taken; (2) promotion of environmental awareness among bank staff; (3) promotion of the bank as a regional resource center; and (4) support for projects with direct environmental benefits as well as initiation and processing of environment-oriented projects.

The bank has proceeded well beyond the exploratory stage in environmental planning and management after formalizing its environmental policy in 1986. A framework has been established for incorporating critical environmental concerns into the overall objectives and strategies for socioeconomic development in its DMCs. Major activities undertaken in support of these policies and procedures are briefly described below.

Integration of environmental considerations

In Country Programming and Strategy Studies. Environmental considerations were effectively integrated into the bank's country programming exercises in 1988. Management instructions emphasized the importance of adopting such procedures when formulating country programs and sectoral lending strategies, particularly, in resource-based sectors, such as agriculture, fishery, forestry and energy. Subsequently, the need to integrate environmental issues into sectoral lending strategies, identify opportunities for assisting projects with significant environmental components (or environmental projects per se) and conduct

policy discussions on environmental issues were incorporated in the terms of reference of country programming missions (CPM). After review and discussions, the findings of each CPM are incorporated into a country program paper.

Environmental issues in each sector and the environmental dimensions of economic development are included in the bank's country sector strategies. The objective is to alleviate stress on the environment and natural resources.

At Different Levels of Development Planning. The bank has adopted different modalities to assist DMCs integrate environmental considerations at different levels of development planning. (For a diagrammatic presentation of the different steps involved, see Fig. 1.)

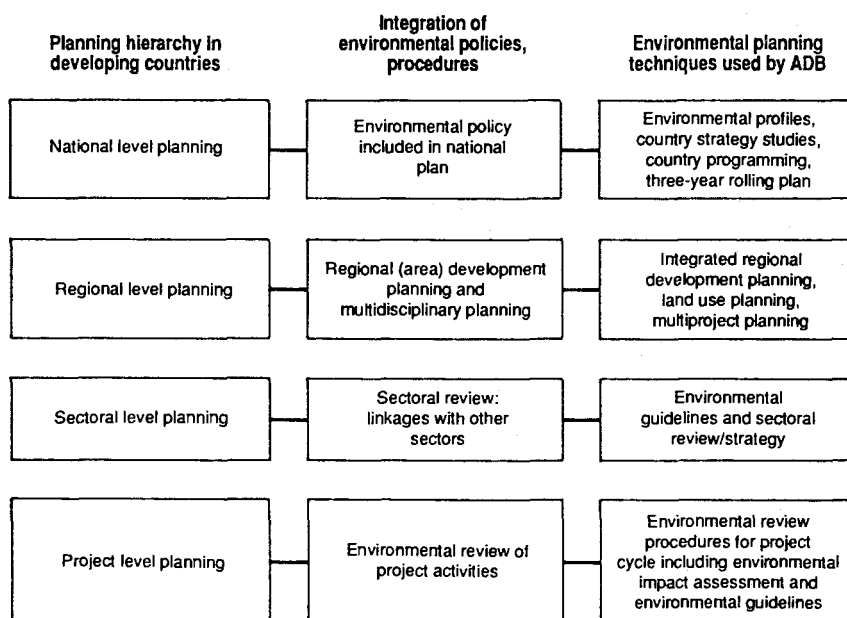


Fig. 1. Planning hierarchy in developing countries showing various approaches for incorporating environmental needs.

Environmental considerations are integrated into national development plans through preparation of the national conservation strategy, environment and natural resources management plan¹; state-of-the-environment reports, environment and natural resources briefing profiles for the DMCs²; and incorporation of environment and natural resources considerations into economic planning.

¹E.g.: TA No. 1206-FIJ: Environmental Management Planning, approved 14 September 1989 (\$600,000).

²Briefing profiles have been prepared for the following countries: Bangladesh, India, Myanmar, Nepal, Pakistan, Sri Lanka, Thailand, Indonesia, Malaysia, Papua New Guinea, People's Republic of China and the Philippines.

Regional economic and environmental development planning³ achieves the objective of blending environmental parameters into economic development plans. By using integrated approaches to regional planning and project design, management of renewable natural resources can be explicitly encouraged. This approach fulfills the need for environmental integration at the macrolevel which the project-oriented environmental impact assessment (EIA) is unable to address effectively. The bank will continue to adopt an intersectoral and multidisciplinary approach to development planning so as to address the cross-sectoral impact more effectively.

At the project planning level, the primary tool for integrating environmental considerations is EIA. An initial environmental examination and/or EIA is conducted for every feasibility study,⁴ generally, in the early stages of project identification and preparation.

Project review and monitoring

To ensure that environmental issues are considered throughout the project cycle, the bank has developed a mechanism by which projects it finances are reviewed and monitored for their compliance with recommended environmental mitigation measures (Fig. 2). The bank is also active in strengthening the capacity of DMCs to perform these tasks. A computerized database which includes project information, relevant environmental issues and proposed mitigation measures is maintained by the Environment Division to facilitate review and monitoring activities. To provide guidance and information to the bank's environment specialists and project staff, six project cycle review reports are generated and distributed to them annually. The reports establish requirements for environmental protection, mitigation and monitoring measures through all stages of the project cycle and also provide early warning on the nature of environmental issues likely to be encountered.

Strengthening of selected institutions in DMCs

Since 1986, when a policy paper identified the need to strengthen national environmental agencies by developing operational skills in environmental planning and management, the bank has assumed a leading role in this regard. Several technical assistance projects on institutional strengthening covering countries such as the Philippines, Nepal, Malaysia, Pakistan, Bangladesh, Indonesia, Vanuatu, Fiji, Laos and Thailand have been approved and/or are currently being processed.

³Guidelines for integrated regional economic-cum-environmental development planning.

⁴The bank's environmental guidelines for selected infrastructure, industry and power, and agriculture and natural resources development projects are useful in this task. Others under preparation include, among others, sociocultural impact assessment, occupational health and safety, environmental risk assessment (as warranted).

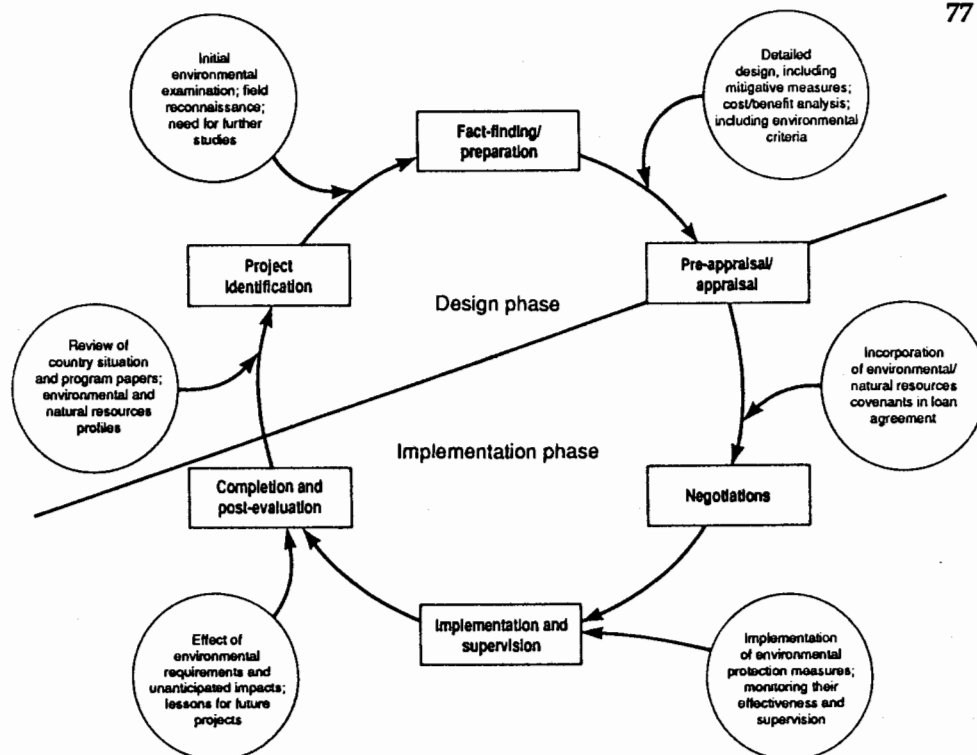


Fig. 2. Project cycle: environmental/natural resources inputs.

Resource center and training activities

Since 1986, several studies have been initiated to improve project formulation in addition to selection and appraisal methodologies. Studies published include: environmental guidelines for selected industry and power, infrastructure, agricultural and natural resources development projects; guidelines for integrated regional economic-cum-environmental development planning; and minimum quality criteria for ecologically sensitive areas. Training of bank staff and DMC government officials to improve environmental awareness is one of the regular activities of the bank's environment specialists.

Cooperation with NGOs and other development agencies

In recognition of the increasing importance of NGOs, plans for increased cooperation with them were also formulated and a study to develop strategies and modes of further ADB-NGO cooperation was initiated. Services of environmental NGOs were built into several projects approved in 1988: the Forestry Sector Program Loan, the Low-income Upland Communities Project and the Manila Metropolitan Region Environmental Improvement Study in the Philippines; the Dhaka Urban Infrastructure Development Project in Bangladesh; and the Institutional Strengthening Project in Nepal.

The bank also promotes exchange of information with multilateral regional and international agencies. It hosted the Tenth Meeting of the Committee of International Development Institutions on the Environment in 1989.

The environmental policy focuses on strengthening relevant institutions and favors the attainment of long-term program loan objectives. For example, the fisheries⁵ and forestry⁶ program loans for the Philippines include a number of institutional and policy reforms to ensure rehabilitation and development of the country's fisheries and forest resources.

Approach to Coastal Resources Management

Against this background of environmental policies and procedures, the bank has undertaken a significant role in designing resources conservation projects. One such program is the FSP loan for the government of the Philippines. The bank's method in CRM utilizes a multidisciplinary approach in planning; develops an institutional arrangement for implementation; develops linkages of this sector with the other productive sectors such as forestry and tourism; and provides for policy interventions. This approach is described below using the FSP as an example.

The FSP is the government's first coordinated initiative to address the sector's multiple problems and opportunities. The objectives of the program are best described in terms of the sectoral priorities it will address: (1) in coastal fisheries--resource regeneration, environmental rehabilitation, balancing of fishing effort to maximum sustainable yield (MSY), control of destructive fishing activities and alleviation of poverty among municipal fisherfolk, particularly, through diversification of income-generating activities; (2) in aquaculture--intensifying production to raise yields, productivity and quality, particularly for domestic consumption; and (3) in offshore, commercial fishing--inducement of commercial fishing away from overfished coastal waters and into the exploitation of deeper sea resources which are especially important for exports.

Policy and institutional reforms and related program initiatives

The program consists of a series of policy and institutional reforms required to improve production, productivity, income, equitable distribution of returns and sustainable management of the sector's resources. The major area components of the program are:

⁵Loan No. 971-PHI (SF) and 972-PHI (OCR): Fisheries Sector Program, approved 26 September 1989 (\$80M).

⁶Loan No. 889-PHI (SF) and 890-PHI (OCR): Forestry Sector Program, approved 28 June 1988 (\$120M).

Policy Framework and Sector Plan. This plan is an urgent priority to ensure that government agencies and private sector bodies involved in fisheries (including local governments, fishermen's associations, commercial fishing companies and banks and NGOs) are aware of the government's plans for the sector, and their activities and investments can be complementary and mutually supportive, rather than conflicting.

Licensing and Rents for Use of Public Resources. Licenses will be approved based upon resources and ecological assessments of the fishing/fish farming areas, and will be guided by established MSYs for major identified fishing areas. These assessments will be conducted on an ongoing basis under the National Fisheries Information System (NFIS) which is being introduced under this program as part of the sector plan.

These actions will help to: (1) raise the utilization, efficiency and productivity of commercial fishing vessels; (2) bring unutilized or underutilized leased public lands for aquaculture under more intensive cultivation and thereby increase their production and productivity; (3) ensure that major identified fishing areas are fished at or under their established MSYs; and (4) ensure that the national exchequer receives additional financing from upgraded rents to help finance resources management and environmental rehabilitation programs for the sector.

Fisheries Laws and Law Enforcement. A comprehensive fisheries law enforcement program is to be implemented to: (1) ensure that all municipal governments in targetted priority fishing areas enact and implement municipal fisheries ordinances; (2) obtain widespread community support for responsible resources management, effective self-regulation and compliance with related fisheries laws; and (3) approve the government's capability to enforce fisheries and environmental laws and to apprehend and prosecute violators.

The scope of activities that will be initiated as part of the enforcement program includes the: (1) organization of fishermen into associations, with the assistance of NGOs, to facilitate self-regulation and monitoring of municipal waters; (2) training of fishermen, NGOs and local government officials in fisheries laws, ordinances, procedures and requirements for documenting and handling evidence; and (3) establishment of municipality-based, multi-organization law enforcement teams with representatives from the fishermen's associations, NGOs, local government and other agencies.

Based on this expertise, substantial impact is envisaged in the following areas: (1) minimization or elimination of destructive fishing techniques such as with dynamite and cyanide; (2) elimination of illegal mangrove cutting for wood and charcoal or fishpond development; (3) exclusion of commercial fishing from inside the 7-km limit; (4) improved production returns to municipal fishermen due to (3) above; and (5) legal support and sanctions to undertake coastal resources and environmental rehabilitation, conservation and management programs by the local fishing community.

Database for Fisheries Resources Management. The system will be initiated with comprehensive resources and ecological assessments of major fishing areas and inland fisheries/aquaculture regions. The system will systematically collect, store and analyze data in four major categories: (1) fisheries resources, including stocks and harvest data for fish and invertebrates; (2) fisheries habitats, including

the quality of coastal waters, and the quantity and quality of coral reefs, mangroves, fishponds, etc.; (3) inland pollution sources contributing to pond and/or bay contamination; and (4) human resources, including number of fishermen, boats and gear used and key socioeconomic data of fishing communities.

It is expected that the system will play a central role in supporting future fisheries development in the country. It is essential that future policy, program and investment decisions in the sector be based upon a reliable, technical, ecological and economic database. In this connection, the NFIS will serve as a valuable tool for policy- and decisionmakers. Its impact is also expected to be felt at the local level, where involved fishing communities will become more aware of key data relating to local resources, such as habitat status and pollution sources and will accordingly influence their community-based resources management programs. Finally, it is hoped that the system will establish greater clarity on the extent, locations and migratory patterns of tuna stocks, enabling commercial operators to exploit the resource more extensively, particularly for the country's export markets.

Coastal Zone Management Program. A coastal zone management program (CZMP) will be introduced based upon the following premises: (1) the coastal zone will be the priority area of emphasis of the sector plan and program as it is the source of nearly 75% of total fisheries production (since it includes municipal fisheries as well as most of the aquaculture production); (2) the fishermen are the real managers of the coastal fisheries resources because they make the day-to-day decisions; government will not, therefore, attempt to manage the coastal resources directly, but will facilitate their management by the local fishing communities; (3) the local fisherfolk should be helped to organize themselves, preferably through NGOs which have an advantage over government in organizing communities; and (4) "management" will necessarily include control of resource access and programs to enhance, develop and sustain the resource.

The objectives of the CZMP are to: (1) rehabilitate, regenerate and manage, on a sustainable basis, the fisheries resources of the coastal zone (which include stocks as well as habitat); (2) reduce and eliminate, if possible, destructive and polluting factors which degenerate coastal fisheries resources (illegal fishing techniques, inland pollutant sources, indiscriminate destruction of mangroves, etc.); (3) assist municipal fishermen in moving away from fishing and into diversified income-generating activities; and (4) achieve all of the above through community-based, NGO-assisted, grass roots initiatives.

The CZMP will promote and finance the following specific activities within each identified CZMP area: (1) establishment of a fisheries resource and ecological database with the assistance of the NFIS; (2) engagement of one or more NGOs per area to organize and prepare fishing communities to undertake CZMP in the area; (3) enactment of the municipal fisheries ordinances; (4) establishment of a CZMP area coordinating committee to coordinate activities, law enforcement and other CZMP activities; liaise with national agencies such as the Philippine Departments of Agriculture and Environment and Natural Resources; and monitor progress; the committee will include representatives from the fishermen's associations, NGOs, local government and other local, private and public

sector bodies; (5) development of an area-specific management plan based upon the resources and ecological assessments and the capacities of local communities; (6) undertaking of community-based programs for regenerating/rehabilitating shallow-water habitats (coral reefs and mangroves); installing artificial reefs; initiating mariculture in protected shallow waters and income diversification programs such as fish processing, backyard farming, handicrafts, etc., for fisher-folk; and identifying and controlling destructive and polluting factors harming the coastal resources and their ecological balance.

Research and Extension. National fisheries research should support the new FSP. The Bureau of Fisheries and Aquatic Resources, with consultants provided by the program, carefully assesses the existing research role and capability of the government agency concerned before a long-term research program is developed. This program will have its own budget and stress fisheries management. It will include mechanisms for: (1) identifying and deciding priorities for key research needs; (2) responding effectively to the needs of fish producers; (3) contracting research to outside agencies as well as undertaking it in-house; and (4) ensuring the rapid transfer of research results into practical extension materials.

Credit Program. The objectives of the credit program are to improve and support income diversification among marginal coastal fishermen; and to support the intensification of aquaculture development. There are accordingly two distinct target groups with their own specific needs: the marginal coastal fishermen, who are generally without assets, dispersed in often remote fishing villages and will generally require flexible collateral, group-based credit for income diversification projects; and the aquaculture fishfarmers who have some assets (their land or at least a lease-title if it is public land), are generally concentrated in specific areas and whose credit needs are individual. In both cases, credit is considered only a support to the more important technology and extension/training assistance which will be provided under the research and extension program.

Post-harvest Infrastructure and Marketing. This component aims to: (1) reduce post-harvest losses; (2) improve the quality of the product for domestic and export market consumers; (3) enhance returns to small-scale fishermen; and (4) promote efficiency in packing and processing the product for export.

Program benefits

The FSP will initiate systematic and coordinated efforts of both government and nongovernment sectors in the sustainable development and responsible resources management of the fisheries sector. In this process, some of the benefits which will accrue to the economy and the country are as follows:

1. Fishing effort in targetted coastal areas will be balanced with resources conservation and management initiatives so that municipal fishing production becomes sustainable in the longer term, and fishing areas are fished only to their MSYs.

2. With the control of illegal and destructive fishing and the inducement of commercial operators to exploit deeper sea waters, as well as with income diversification efforts among municipal fishermen, incomes of the latter are expected to increase.
3. CZMPs, such as on mangrove plantations, artificial reefs and fish sanctuaries planned under the FSP, will have not only beneficial, long-term, ecological impact on the fisheries resources in the coastal zone, but will also offer immediate financial returns to municipal fishermen, thereby alleviating their poverty.
4. With the rationalization of license fees and rents paid for the privilege of using public resources for fisheries exploitation (particularly offshore fishing by commercial operators and aquaculture development on public lands), productivity in commercial fishing and aquaculture is expected to increase.
5. Planned initiatives to assess more precisely offshore tuna and cephalopod resources, to test out new fishing methods and techniques, particularly for cephalopods; and the expansion of trade incentives for commercial operators should help increase commercial production and related exports, and make the Philippines more competitive in the international export market, particularly for tuna, shrimps and cephalopods.

Conclusion

The primary impacts and benefits of the bank's approach towards CRM are intended to be social (i.e., poverty alleviation) and environmental in nature. Other expected benefits are sustainable production, improvement in diversity, quality and productivity, as well as increase in foreign exchange returns through expanded exports.

Coastal Resources Management: the Singapore Experience

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Abstract

Limitations in space and natural resources have compelled Singapore to develop coastal resources management (CRM) strategies uniquely its own. Singapore's basic strength--its strategic location in a maritime region--propelled it to become an entrepôt and trading post in the 19th century. This factor has also given the country the edge to vigorously expand into other commercial enterprises, including port and shipping services, petroleum and manufacturing industries, recreation and tourism. Reclamation has been the logical solution to accommodate massive housing demands and fast-paced industrialization. Because of the strategic site and intense coastal activities, the government has strictly enforced regulations and international treaties to control coastal pollution. Existing coastal management schemes are under review and new ones have been devised, particularly on environmental conservation and restoration, for future contingencies. The Singapore model illustrates the wisdom of tailoring coastal area management (CAM) plans to conform with the indigenous requirements of each ASEAN country.

Introduction

Coastal resources are important contributors to the economic well-being of most of the countries in the ASEAN region. Nearly 70% of the region's total

population lives in the coastal area and is economically dependent, directly or indirectly, on coastal resources. Within the next 30 to 35 years, the population of countries is expected to double. The coastal resources will be placed under greater pressures as countries in the region strive to maintain or upgrade the standards of living of their people. These pressures may be manifested in a variety of ways. For instance, there may be more intensive coastal activities such as fishing, aquaculture, mining, industrialization and oil prospecting. The ASEAN region faces a challenge to ensure that its need for intensive coastal resources utilization is achieved with sustainable development.

Since 1986, ASEAN, assisted by the International Center for Living Aquatic Resources Management (ICLARM), has devoted considerable attention to the issue of CRM. Each of the six participating member-countries has evaluated its coastal resources and environmental problems, and considered how to resolve them in a sustainable manner. The outcome of this evaluation has led some countries to implement CAM plans designed under the ASEAN/US Coastal Resources Management Project (CRMP). These well-formulated plans include specific measures such as the issuance of permits for fishing, logging and mangrove harvesting. While some plans have succeeded, others have failed due to problems such as difficulties in enforcement.

Over the years, Singapore has managed her coastal resources based on her own management plan different from those devised under the CRMP. The editorial of the April 1987 issue of the *Tropical Coastal Area Management*, the official newsletter of the CRMP, described Singapore as being "on one end of the spectrum in terms of coastal management and resource use conflicts. Compared to the other ASEAN countries, it is a unique example." The editorial further said, "This is not to say that Singapore's coastal management is lacking. Singapore has a carefully managed coast to support its immediate needs and values. The primary need has been and is space."

Definition of Coastal Area in Singapore

The lack of space, both on land and in the sea, coupled with little or no natural resources, have been the key factors influencing the shaping of Singapore's strategies in CRM. Singapore consists of a main island 41.8 km long and 22.5 km wide and about 60 islets, commonly referred to as "offshore islands". Including the latter, Singapore's total land area is only about 625.6 km². So small is Singapore that her size has even caused experts on CAM to differ in their definition of coastal zone in Singapore's context.

Typically, the landward limit of a coastal zone is defined as the limit where the landward effects of marine influences such as tidal penetration or salt water intrusion end. Based on this physical argument, the landward coastal zones of some ASEAN countries have been assessed to extend some 20 km or more from the coastline. Since no part of Singapore lies more than 15 km from the sea, this definition will make our entire island nation a coastal zone. To overcome this

anomaly, it has been suggested that a more operational-related terminology, the coastal area, be applied to Singapore. So defined, coastal area in Singapore includes all reclaimed land and properties that have a water frontage, as well as land used for marine-dependent activities.

History of Coastal Area Management in Singapore

Changes to the coastal area in Singapore took place right from the time of its founding by Sir Stamford Raffles in 1819. However, it was in the past 30 years or so that Singapore has undergone rapid and momentous developmental changes. In 1959, when the country achieved self-government, she had to overcome the problems of high unemployment, housing shortage, poor infrastructure and communication facilities, and deteriorating urban conditions.

The situation called for maximizing the utilization of the nation's limited resources towards socioeconomic reforms. To facilitate this, a number of quasi-government agencies or statutory boards were established to plan and implement socioeconomic policies. The emphasis was on public housing and industrial development. Singapore's original coastal management strategies were inevitably linked to these objectives. Since then, the economy has steadily grown, which further intensified resource utilization. New uses and high-technology activities which have higher-value added gains have replaced older ones that were low-yielding, labor-intensive or occupied too much space.

Coastal Resources Utilization

Unlike our ASEAN neighbors, Singapore lacks such commonly acknowledged natural resources like forests, agricultural land and minerals. Consequently, the country's strategic location in a maritime region and her limited but valuable land space have become her only coastal resources. Based on this consideration, we can divide the major coastal resources utilization into seven categories, as follows:

Port and shipping services

The global and regional geographical configuration of land masses has provided Singapore with a strategic location for maritime transport. Indeed, this valuable resource led the British East India Company to select Singapore for development into an entrepôt and trading post in the 19th century to serve the surrounding region. Due to this strategic location, the country has been able to

achieve much of her economic progress. Today, she is rated as the world's busiest port in terms of shipping tonnage.

The Port of Singapore Authority (PSA) is responsible for administering the port and 580 km² of port waters (almost the entire territorial waters of Singapore), providing and maintaining port facilities and services, regulating traffic and navigation in port, supplying pilotage and promoting the use and development of the port. A statutory board under the Ministry of Communications and Information, PSA was established in 1964 to replace the Singapore Harbour Board. At present, 14 km of wharf length are capable of handling more than 80 million freight tons annually.

Marine industry

There are three main sectors in the marine industry: shipbuilding, shiprepairing and oil-rig construction. The industry grew steadily as a spinoff from the growing importance of entrepôt and trade services in Singapore. However, the marine industry in its present scale was developed in the late 1960s following the attainment of self-government. It was then that three large shipyards, Jurong, Sembawang and Keppel, were formed. Between 1972 to 1982, the marine industry grew at an average rate of 23% per annum. At its peak, revenue from the marine industry topped US\$1.3 billion. However, global recession in 1982 caused severe setbacks to the industry but there has been some recovery in recent years.

Petroleum industry

The petroleum industry in Singapore includes refining, storage, transshipment of petroleum products and petrochemical manufacturing. This industry began in the late 1960s when Singapore was chosen by the multinational oil companies for her proximity to the Middle Eastern crude oil and her strategic location for distribution of the refined products. The first refinery was established in 1961 in offshore Pulau Bukom by Shell Company. The introduction of very large crude carriers and political and economic factors further led to the growth of the petroleum industry. Today, there are five refineries in Singapore with a total refining capacity of more than 1 million barrels per day, making her one of the biggest oil refineries in the world. The petroleum industry is a major contributor to the Singapore economy, both directly and through supporting services. It has a significant impact on foreign trade, port activities, marine industry and overall economic growth.

A significant recent addition to the petroleum industry is the petrochemical sector. The setting up of the Petrochemical Complex of Singapore (PCS) on Pulau Merbau has enabled the abundant by-products from the oil refineries to be used. PCS has stimulated the growth of many downstream industries that use

petrochemical products as raw materials in their manufacturing processes. These industries have benefitted from savings in shipping cost and easy access to worldwide market through Singapore's strategic location and port facilities.

Other manufacturing industries

The coastal area has played an important role in the industrial development of Singapore. In 1961, the Economic Development Board (EDB) was formed to develop the industrial sector. Its first industrial project was to develop the Jurong Industrial Estate. In 1968, EDB created a statutory board, the Jurong Town Corporation (JTC), to manage Jurong Industrial Estate (later renamed Jurong Town) and to further develop Jurong Town and other industrial estates in Singapore. JTC has also established specialist industrial estates catering to the aviation industry, warehousing services, marine bases and heavy industries in the Southern Islands. Recently, JTC has promoted investments in the high-technology and skill-intensive industries and created a 125-ha Science Park aimed at encouraging research, development and innovation in the manufacturing sector.

Fisheries and aquaculture

The fishing industry in Singapore plays a small role in the national economy because of the lack of fishing grounds. Singapore imports most of her fish supply both for local consumption and export. Local supply contributes less than 13%, mainly from capture fisheries along the coastal waters and from aquaculture. Nevertheless, the value of the country's fish exports has exceeded their import value. Fish exports from Singapore take the form of re-exports and export of processed fish products. Again, her strategic location is vital to the fishing industry which plays the role of a distributor rather than as a producer in the international fish market.

Residential uses

Over 2 million of the 2.65 million population of Singapore live in public housing estates and new towns which occupy nearly one-sixth of the total land area of the country. The need for high-rise, high-density living is obvious in view of the shortage of land and the many competing uses for it. Public housing development is the responsibility of the Housing and Development Board (HDB).

Recreation and tourism

Competition for the limited coastal area with the other uses has resulted in allotment of only a small part of the coastal area to the development of recreational facilities. Over the years, coastal parks and swimming beaches have been developed. Tourism is a significant foreign exchange earner for Singapore. To cater to tourists and local residents, development of recreational and tourism facilities has extended to the offshore islands. The Sentosa Development Corporation is responsible for developing the water-based tourist resorts on Sentosa, St. John's and Kusu Islands.

Reclamation of Coastal Area

Some of the land space which has been devoted to the seven major uses of coastal resources is reclaimed land with an aggregate area of 45 km². Since self-rule, Singapore has embarked on a series of large-scale reclamation projects for her massive public housing development and rapid industrialization. The three main statutory boards responsible are HDB, JTC and PSA.

Control of Coastal Pollution

Being at the crossroad of the world's major shipping lanes, coupled with the intensity with which the coastal area is being used, Singapore is fully aware of the threat of coastal pollution from ships as well as from land-based sources. To control coastal pollution, various measures have been implemented and stringently enforced.

Pollution from ships is controlled by PSA under the Prevention of Pollution of the Sea Act 1971, the Civil Liability (Oil Pollution) Act 1973 and other relevant regulations under the Port of Singapore Authority Act. We have also acceded to various international treaties aimed at preventing pollution to the marine environment. Soon, Singapore will be a party to the International Convention for the Prevention of Pollution from Ships 1973 and 1978 (or MARPOL 73/78). Measures are also implemented to limit the potential damage caused by accidental oil spills from refineries and oil tankers. The Marine Emergency Action Procedure, coordinated by the PSA, activates the resources of the oil terminals and several ministries, including the Ministry of the Environment (MOE), to contain and clean up the spills. In addition, Singapore participates in joint oil spill exercises with Malaysia and Indonesia.

Coastal pollution from land-based sources and pollution in the inland waters are controlled by MOE under the Water Pollution Control and Drainage Act

1975. In Singapore, over 97% of all domestic sewage is treated at modern sewage treatment works using conventional methods. Domestic premises in outlying rural areas, not served by sewers, are provided with modular sewage treatment units. Wastewaters from commercial and industrial premises are treated in-house to meet the permissible limits for trade effluent discharge before they can be discharged into public sewers. There are now seven sewage treatment works in Singapore connected by some 2,150 km of sewers.

Other activities carried out by MOE include phasing out pollutive riverine activities and pig farming; and resiting street hawkers. The MOE, through the Environmental Public Health Act, also prohibits discharge of solid wastes into water bodies.

We are happy that our efforts to control coastal pollution in Singapore have met with some success and that our coastal water quality has improved.

Approach to Coastal Resources Management

The approach taken by Singapore in CRM has been largely influenced by her limitations in natural resources and space, and also her urgent need to institute social and economic reforms following the uncertainties after achieving self-rule.

This approach has served us well. Statutory boards set up to ensure efficient use of our limited coastal resources have succeeded to achieve, in varying degrees, their respective objectives. It is to their credit that these statutory bodies are still able to keep our coastal environment sound, given many constraints.

However, this is not to say that Singapore will remain stagnant in her approach towards the coastal environment. Having achieved sustainable development to a certain extent, the time has come to review existing strategies and add new ones to gear herself for the future. Our planning guidelines for developmental projects will remain stringent and every step taken to ensure that coastal activities will not cause irreversible damage to the environment.

Already, more emphasis has been put into environmental conservation and restoration. After much efforts, we have succeeded in cleaning up the Singapore River and the Kallang Basin. These once highly polluted rivers have been given new leases in life and have been returned as resources for the people to enjoy.

The Sungei Buloh Bird Sanctuary will provide our future generation with the opportunity to be close to nature. Other conservation projects will undoubtedly be implemented. More recreational facilities have now been provided in coastal areas and are freely accessible to the general public and tourists alike. The government has formed an inter-ministerial committee to look into increasing public awareness of the living environment through education and participation. We are hopeful that there will be greater community-based participation in the future.

Conclusion

The CAM plans which the ASEAN/US CRMP and ICLARM sought to implement in the ASEAN region are laudable. The plans will succeed if we tailor them to suit the needs of the country implementing them. Singapore endorses the CAM objectives. We will indeed refer to the management concepts for guidance in incorporating new strategies into our existing approach to CRM.

On this note, I wish to conclude my presentation by thanking the Government of the Philippines and ICLARM for their valuable contributions in hosting this very important and timely international conference.

Session 4: Community Awareness and Participation in Sustainable Development

The Role of the Local Press in Creating Public Awareness of Coastal Resources Management

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Abstract

Using the Malaysian environmental situation as a point of reference, this paper delineates the crucial role of media beyond the traditional channel of communication and information, as a vital agent for social change. Educating the public about sound coastal resources management (CRM) should arouse awareness and provoke interest that will motivate them to positive action. The media can effectively perform its functions by following three basic writing guidelines: (1) using layman's language; (2) humanizing the story with practical, specific information perceived as affecting or even threatening people's livelihood and lifestyles; and (3) packaging the product, which calls for skill and creativity in content, form and style. Policymakers and implementors are enjoined to support the media through aggressive and extensive education and information campaigns on judicious environmental management.

Introduction

The picture painted in the latest Malaysian Government's Environment Quality Report on water pollution is rather dim. But not necessarily grim.

As in other countries in the region, Malaysia has environmental problems that require the attention and ingenuity of the government and its people to overcome.

The media has a pivotal role to play in this daunting task. It must act as the conduit for the free flow of data and ideas among the government, the degraders of the environment (not always because of need, but of greed) and the victims. But first, let us look at the coastal and marine situation that exists in Malaysia today.

Marine pollution is defined by international organizations as "the introduction by man, directly or indirectly, of substances or energy into the marine environment (including estuaries) resulting in such deleterious effects as harm to living resources, hazards to human health, hindrance to marine activities including fishing, impairment of quality for use of sea water and reduction of amenities."

In Malaysia, total suspended solids, fecal coliform (human and animal waste pollution) and oil and grease continue to contaminate the coastal waters despite considerable improvements in most of the waters off the west coast of northern Peninsular Malaysia. The problem is most serious in the waters of the West Malaysian States of Pahang (facing the South China Sea), Melaka (facing the Strait of Malacca) and the East Malaysian state of Sabah.

The coastal waters of the states in northern Peninsular Malaysia were also found to be seriously affected by heavy metal contamination, particularly of cadmium, copper, mercury, nickel and lead. About 90% of the samples collected in a study exceeded the recommended limits for conservation of marine resources.

As for oil and grease contamination, most of the waters off the Peninsular Malaysian states have either deteriorated or remained stagnant. On the quality of river water, a study conducted between 1985 and 1989 found that 121 rivers were slightly polluted and 62 seriously so.

The Federal Department of Environment in the Ministry of Science, Technology and the Environment has done much to check industrial and other forms of pollution over which it has jurisdiction. However, there remains a number of major pollution sources and environmental degradation problems over which only the State Governments have control and for which there are few controls. These include sewage, animal wastes, municipal and solid waste disposal and soil erosion.

The Strait of Malacca is one of the good (or bad?) examples of what can happen to a perfectly safe waterway if mankind does not keep itself in check. The strait is the most important fishing ground in West Malaysia, accounting for 70% of the total fish landings. The number of fishermen is estimated at over 50,000.

The most widespread pollutants entering the strait are terrestrial alluvial and inert seabed sediments, slicks of crude oil, detergents, pesticides, sewage, garbage, plastics, bottles, synthetic fibers and wastes from the combustion of fossil fuels.

Limits to the Sustainable Use of Marine and Coastal Resources

The development of the coastal and marine resources of the Strait of Malacca is influenced naturally by the management of both the terrestrial and marine environments. According to one expert, if sustainable forms of renewable resource development are to be achieved, greater attention must be given to the interaction of factors such as the effects of changes in the hydrology of rivers, conversion of swamp forests to agriculture, reclamation of mangrove for fishponds and its impact on marine fisheries and other activities.

A coastal zone management approach where land and water resources developments are treated as interactive factors would assist in the resolution of some of the management problems now apparent in the strait.

Using Layman's Language

All this information, although not new to participants, is nevertheless, important for experts, policymakers and politicians, and they will all recognize it as such. But the question is: how important is it to the layman? The answer is: very important.

The layman, the newspaper reader, is not the captive audience you meet in seminars and conferences. The reader's attention span is small when it comes to dry facts and lean figures. He would rather spend his time with Bill Cosby than with relatively unknown marine scientists discussing the delicate balance of the ecosystem.

The work of experts in the field of water resource management needs the full support of the people, of an informed people. They depend for their information on the media and the media in turn depends upon the experts. But, without the layman's involvement in the efforts of the scientists, planners and politicians, efforts in coastal resources development on a sustainable basis will come to nought.

The next question, therefore, is: how does one attract the layman? Any self-respecting news editor knows that to get the reader, scientific jargon must give way to what is known as journalese, the lowest common denominator the journalist uses to identify with his readers. Journalese cuts out the frills and tells the story almost in conversational style.

There is also another responsibility the media has to bear. It must not only depend on its tried-and-tested criteria of "man bites dog" to determine what is newsworthy. For that approach is now a simple, even simplistic, view of the role of the media. The press today plays a far more important role. It must be an agent for social change as well as fulfill its traditional role of providing entertainment and general information. It must play its part as the conscience of a nation, act as the voice of reason, champion the cause of the man without means and educate the people about sound environmental management.

The latter, of course, includes educating the people on what are coastal resources, how these can be destroyed by carelessness and ignorance and how they can now begin to restore, at least partially, what has been damaged. Why is it so important to maintain the ecosystem? Why should they look beyond the confines of their own requirements and problems of their little villages? What are cross-boundary issues? How can they help to retain nature's delicate balance?

These are issues of which ordinary people must be adequately informed. But this is easier said than done. They are not the captive audience like us in this hall. It takes a certain ingenuity, a little creativity and a whole lot of commitment on the part of editors to turn every scientific treatise or list of seemingly meaningless figures into readable, interesting and easily understood stories of the right length.

Humanizing the Story

Next, the reader will read the story if it is newsworthy. One way to make it such is to humanize it. Statistics, pronouncements and warnings are all fine, but they hardly constitute hard news.

The reader wants to know why the catch from the river or sea is decreasing and what the authorities are doing to bring back the good old days. He wants to know more about the red tide in Sabah.

Is the new textile factory upriver, where a reader's children are employed, discharging effluents that are slowly killing the river on which his entire village has been depending for years for its source of protein? If so, should he and his co-villagers demand the closure of the factory and, thus, put their children's employment in jeopardy, or should they get the factory to install treatment plants? What sort of treatment plants are suitable and feasible?

For the purpose of discussion, let us take the case of soil erosion in Malaysia. A survey conducted by the *New Straits Times* revealed that the Malaysian coast is eroding at an alarming rate. About 27% of its 4,809 km of shoreline is subject to erosion of varying degrees of severity.

The authorities have identified 53 areas where coastal erosion is threatening important installations and facilities like beaches, resorts, roads, houses and other buildings.

A huge sum of US\$220 million is needed to shore up the most critically eroded coastal areas. The full findings of the survey were published in the newspapers in October 1989. Sadly, however, public response to the exposé was practically nil. The subject did not capture the imagination of the reading public. There was only one response, not from a layman but from an interested academic institution.

The reason for the poor response is simple. The story did not translate into the lives of the people. On the other hand, in the ten months leading up to that exposé, the *New Straits Times* carried at least six other stories on the same subject, but this time, giving specifics—how many homes were affected, what the

business community had to say on the matter and what at least one State Government was doing about it.

These stories were people-oriented and, therefore, generated more interest than the exposé. These stories were subjects of follow-ups generated by the paper's own newsdesk. The point here is that for the people to be interested in any subject, their livelihood, their lifestyles, their habits must first be affected or seen to be threatened.

Packaging the Product

The marketing boys call it "packaging the product". Whatever description one uses, there is no shortcut to grabbing the reader's interest. This can be done through skillful writing (headlines, straplines and introductions) and deliberate positioning.

We have spoken of simple writing, of humanizing stories and of packaging the product.

Naturally, it is the task of the media concerned to ensure that these elements apply to every story, including spot news items and features on CRM. There are adequate numbers of journalists in the region capable of doing this. Unfortunately, very little is being done by the media to report and/or comment on matters relating to CRM. The reasons are not hard to find.

Firstly, it takes a lot of precious newsroom time to process a scientific paper and translate it into readable prose. That time is usually used to do other tasks, like writing captions and rewriting press releases about people who climb up and down corporate ladders.

Most newspapers and other media organizations are agreed that broad environmental issues are of interest to the general public and will be well-received, provided somebody else packages the stories for them in an interesting manner. How can this be done?

The relevant organizations charged with the responsibility to formulate sound policies for CRM should consider the following:

1. Conduct intensive courses for selected journalists on all aspects of CRM and related subjects. Several multinationals, e.g., Esso and Shell are already doing this with great success.
2. Maintain a constant flow of information from those who manage the resources to the media. At present, very few people, outside this group, know anything about all the important work being done in this field.
3. Distribute pamphlets, booklets and other periodicals, written for the layman, to the press and to the general public on a regular basis.
4. Set up a clearinghouse for accurate and speedy information on national and regional bases.
5. Engage the services of good public relations firms for effective dissemination of news, features and photographs so that reporting on coastal matters becomes a routine matter rather than on an ad hoc basis as it is now. The accent must be on prevention of destruction rather than on seeking remedies after the event.

The media indeed can play a very important role in educating the public on this relatively new and specialized subject of CRM. But it too needs help. And help can only come from the experts deeply involved in strategic planning and policy implementation.

Mobilizing Community Awareness: The Lingayen Gulf-Agoo Setting, Philippines

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Abstract

Environmental problems are predominantly caused by the human factor and conversely, demand solutions initiated by people. The appropriate strategy, therefore, in coastal area management (CAM) is to mobilize people to develop environmental awareness and actively participate in plan formulation and implementation. The present conditions of the environment and natural resources must be analyzed from a holistic perspective, taking into account the economic, political, social and cultural contexts in which they occur, as in the case of the Lingayen Gulf in the Philippines. To realize the foregoing objectives, a combination of three approaches, namely, community organization, technical assistance and networking, is necessary in designing the management plan. Using this methodology, current programs in La Union put to work the integrated coastal resources management (CRM) plan in the Lingayen Gulf, with its essential components now operational.

Introduction

This paper is an objective discussion of the essential elements for an integrated plan for mobilization of community awareness and participation in the CAM of

the Lingayen Gulf. The presentation of the plan implementation is based on the actual experience encountered in the three villages (*barangay*) of Agoo, La Union, namely, Purok, San Roque East and San Roque West. The basic postulates, assumptions and propositions of community mobilization are also discussed.

Basic perception

The need for a comprehensive plan for managing the coastal resources for sustainable development has become imperative in the region. Most of the requisite studies on the physical attributes and conditions of the natural resources in all the areas of concern are at hand, and the extent of destruction or degradation of such resources is fairly measured. The chilling effects of such expansive devastation are now intensely felt. The inevitable results of improper management and inaction are clear.

In other words, the situation analysis is complete and all the negative forecasts are now an unfolding reality. To address these problems, plans for CRM have been targetted at selected gulfs and bays in the region, one of which is the Lingayen Gulf, along which the town of Agoo, La Union, is located.

A fundamental problem plaguing management plan development and implementation is a basic misperception regarding the appropriate role of the local community in the process. In many circumstances there are considerable differences in background and perception between those individuals charged with resource planning and those whose resource-use practices are the subject of management plans. These differences arise from social, economic, cultural, technological and educational factors, among others. For example, there is a tendency for technocrats in government agencies involved in resource management to view resource management issues solely as technical problems requiring exclusively technical solutions. However, it is now broadly recognized that this narrow approach has not been successful.

In formulating the "Integrated coastal area management plan of Lingayen Gulf, Philippines," there arose some questions regarding the various aspects of the proposed policies and strategies as initially they did not seem to address community concerns adequately. This perception led to uncertainty on whether or not the local leaders would *support* the plans for the development of the natural resources and whether or not the people or community would *implement* such a plan. No matter how good a plan is on paper, it is useless if not supported by the local communities and political leaders. The matters of political leadership and community participation are thus essential for a successful implementation of any plan for CAM.

Planning postulate

There can be no valid issue or debate, therefore, against the proposition that the end-goal of every planning process and activity is man himself.

A classic example of this basic proposition is the fact that man's fishing gear were once crude and simple, as they could then very well supply his basic needs. In particular, in the Lingayen Gulf, he once had no need for seaweeds which he did not perceive to be edible. His simple lifestyle deemed corals unnecessary. However, in the course of time and as his needs increased, he became aware of the various ecosystems within his own domain, and soon, the productive use and conditions of the resources have considerably changed to such a critical extent that a management plan has become indispensable.

Any environmental problem is the outcome of deliberate human decisions and forces which are traditionally considered outside of environmental concerns. Thus, for any change of his milieu and habitat, man is the means and the end of any development plan. The appropriate strategy then shall be the mobilization of his own awareness and participation in the plan formulation and implementation.

The Lingayen Gulf-Agoo Setting

Rather than accepting the stark and depleted conditions of the natural resources in the Lingayen Gulf simply as an ecological apocalypse, they should be perceived and analyzed within economic, political and social or cultural contexts.

The problem of critical depletion of fish stock/production is not to be viewed simply as due to blast or cyanide fishing. Rather, it is an issue of a survival crisis for the small fishermen who overpopulate the gulf, contend with crude technology and antiquated implements or lack thereof, for productive and sustainable fishing activity, and are at a disadvantage due to the better capabilities of the commercial fishermen.

The low production in aquaculture is not due to the conditions of the natural resources, but to lack of proper technology, unity of those concerned and credit facilities for greater production--all political, economic and social issues.

Resource-use conflicts between commercial and municipal fishing are engendered by lack of political will to effectively implement the numerous, overlapping fishery laws. These are exacerbated by lack of social policy on equality of capabilities, thereby providing undue advantage to the privileged few at the expense of the greater sector of the municipal communities.

The same is true with the conflict on mangrove conservation versus aquaculture, as present national governance not only refuses to exercise its political leadership to protect mangrove resources and public waterways, but is the culprit in the illegal construction of fishponds in such waterways and sheds through the indiscriminate grants of aquaculture rights and franchises in many areas in the gulf, particularly at Sto. Tomas and Agoon, La Union.

The conflict of tourism versus fishery use of coastal waters arises out of social inequality institutionalized in the national policies and laws of tourism, where the local people have no privilege or capability to manage even the meager boundaries of their coastal confines or shorelines. People with lands are bribed to

dispose of these through false promises of economic returns, only to have to squat later and build their houses along the beach shores.

Further, the problem of extreme poverty of coastal inhabitants is due to lack of appropriate population, technical assistance and alternative livelihood programs. The low level of education on fisheries resource utilization arises from lack of education programs and the requisite physical and infrastructure facilities. These would necessarily occasion the continuing weakness of community organization as the proven methodologies are not properly put to work. The latter factors certainly comprise some political, social and economic components of the human condition.

Finally, coral reef and coastal habitat degradation, siltation and seaweed depletion are not due to nature, but to humans. The same is true with the problem of poor environmental quality, such as water pollution and its concomitant effects, land pollution in the form of beach erosion, water salination, encroachment of the sea waters and the greenhouse effect.

The objective and the approach

The mobilization of awareness and community participation, as an end, should be among the principal objectives of a CAM plan. In this way, such a management design is people-centered, community-oriented and resource-based. Toward this end, the tested and effective approach is the combination of three approaches, namely, community organization, technical assistance and networking--as cited in the "Integrated coastal area management plan for Lingayen Gulf, Philippines".

Specifically, the goals of community mobilization would zero in on self-help, community capacity and integration or total empowerment of the community as well as crisis solution schemes. The basis for action is consensus, wherein awareness of the problems and solutions is enhanced among the active groups, as discussions on common interests shall be employed. All the scientific steps for community organization shall also be in place to achieve the desired ends.

Concomitant to this approach is technical assistance, which should immediately address the needs of the people. Technology transfer, capability enhancement schemes and economic support facilities to proper production will be established. Continuing education, nonformal and formal, down to the lowest sector of the community shall be provided. Conservation measures, such as establishment of fish sanctuaries, shall be adopted. Alternative technology and livelihood programs, especially land-based ones, shall be explored and developed. Underlying all these strategies should be the encouragement of various forms of cooperation through the creation of alternative power structures for greater participation, effective maximum utilization of local resources and wider distribution of the benefits to the community.

To complement these strategies, networking will entail the building and bringing-in of support groups, their expertise and commitment to resolve local problems. In particular, networking facilitates the linkage of agencies and insti-

tutions competent in the areas of service development, training and research. It will secure the mobilization of resources from support agencies and bring about closer coordination of activities, such as planning, policymaking, implementation, monitoring, evaluation and manpower development.

Viewed from the perspective of the defined problems and issues, where development of human resources and capabilities is the center of activity, all such agencies will find just merit in greater participation and support of all the programs for management of the Lingayen Gulf. All those elements would then dovetail to enhance local awareness and participation.

Current Programs on Mobilizing Awareness and Community Participation

The plan discussed is currently being put to work in the municipality of Agoo. The site has been identified and comprises the villages of Purok, San Roque East and San Roque West, as these share common problems such as flooding due to lack of conservation measures, crop destruction, salt water intrusion; low agricultural production; lack of potable water; conflict of resource use for waterways and aquaculture; lack of alternative livelihood projects; extreme poverty; low level of education; and other forms of man-made disasters.

The entry, integration and community study process by some workers is now at work. Issue selection and identification of political leaders, through the *barangay* officials, associations and councils, including the youth sector, resulted in their formulation as core groups and organizations. To date, aside from the politicized *barangay* council, the Mothers Class Associations, Youth Council, Barangay Development Council, Disaster Council, Peace and Order Council, Civilian Volunteer Organization, Parents and Teachers Associations, School Nutrition Council and the Peanut Growers Association, are not formally organized as efficient structures of community-building. A continuing advanced training program to strengthen these units will be made.

The technical assistance approach is also being undertaken by the *barangay* council, through infrastructure and social amelioration programs, road building, dredging of canals, repair of bridges, construction of water wells and other public facilities, health, sanitation and nutrition programs and environmental conservation (e.g., tree planting). The alternative, land-based livelihood project is peanut-growing; the material inputs and financial or credit assistance are provided by the local units of the Departments of Social Welfare and Development, Agriculture, Environment and Natural Resources, Health, Education, Culture and Sports; the Population Control Commission; and the municipal administration.

To cap all these processes of coordination and empowerment, the services of a duly accredited nongovernmental organization, a proven community development enforcer, namely, the Institute for Development Alternatives, have been engaged. To date, all the essential elements needed to implement the above-discussed plan for building community awareness and participation are operational in Agoo, La Union. These and the succeeding events will certainly be

such a history as what the community wills it to be, especially with the support of the honorable and distinguished delegates to this workshop.

Conclusion

The plain presentation of the workings of a conceptual position and a definitive approach to a plan show its effectiveness in a given milieu. The plan's advocacy is firmly grounded on the involvement of the community. Its efficacy rests on a correct, objective and incisive analysis of the political, economic and cultural conditions enveloping man, his community and environment. And its validity lies in the ingenuity of man, through his use of the time-tested methodologies. From all perspectives, therefore, the centerpiece of an effective plan for CAM is man, his own awareness and total participation.

The Role and Involvement of Nongovernmental Organizations in the Sustainable Development of Coastal Resources

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Abstract

Severe ecological impacts brought about by the devastation of natural resources challenged nongovernmental organizations (NGOs) in the Philippines to evolve dramatically from welfare service institutions to community developers and dynamic champions of the people's cause. Haribon Foundation, now the largest and leading environmental NGO, best exemplifies this metamorphosis. In 1989, it convened a large coalition of organizations under a program framework, the Green Forum-Philippines. Unfortunately, the parallel trend in the public's growing environmental awareness has been met with government inertia. In the face of this predicament, the Green Forum-Philippines recommends shift in authority from ideology to ecology and power from the state to the people, where NGOs' main function is to empower people and communities towards self-development and self-government. On a broader scale, ASEAN NGOs should take advantage of the region's unequalled biodiversity and transform it into a global center of life science. Initially, an ASEAN academy of life sciences is proposed as a basis for a more concrete transnational advocacy.

The long colonial history and the archipelagic character of the Philippines have tended to promote a form of centralism and a development model in which the state plays the principal role, or provides the engine, as it were, of the development process. There have been changes, to be sure, in the past few decades. Neocolonial ruses have replaced the old setup and the technology of communication has eclipsed distances. The government, however, is still widely perceived as the source of authority and benefaction.

Until recently, NGOs in the Philippines were perceived as vehicles for delivery of services where government was unable to or to compensate for failures of development programs. Although some NGOs' roles have evolved into community development work, a majority still viewed the problem of natural resources and environmental sustainability as separate and distinct from their concerns. Leaving environmental concerns primarily to government, they have at best been contractors for government restoration programs such as reforestation and artificial reef installations. The situation has changed rapidly in the past year, as the effects of resource destruction and degradation impacted severely on rural water supply for crop irrigation, the availability of fish and marine products in municipal waters, the quality of water systems and the soil.

In the 1990 consultation of about 150 provincial NGOs, conducted by the Association of Foundations, the Philippine Partnership for the Development of Human Resources in Rural Areas, and the National Confederation of Cooperatives, the NGOs expressed indignation and alarm over the state of the natural support systems in their respective areas. They voiced the need for more provincial and regional data on natural resources and their exploiters, a mechanism for pressuring government into adopting and enforcing ecological policies, and technical assistance for biochemical analyses of the ecological effects of development projects, both government and private. Today, in the Philippines, the NGOs are in the forefront of struggle.

The evolution of environmental concerns is perhaps best exemplified by the organizational transformation of Haribon, the largest and leading environmental NGO in the Philippines. Starting as a bird-watching society in 1972, it went on to espouse wildlife conservation with its Philippine eagle and tamaraw preservation project in 1978. It became a corporate science foundation for the conservation of natural resources and indigenous culture in 1984. In 1989, it assumed the role of convener of the largest Philippine coalition of NGOs, people's organizations and church groups under a program framework of sustainable development now known as the Green Forum-Philippines.

The Philippine public's environmental consciousness shows a similar evolutionary trajectory: from nature appreciation and site beautification in the 1960s; to wildlife species and habitat preservation in the 1970s; to natural and cultural resources conservation in the early 1980s; and moving on to sustainable development in the late 1980s. (It must be mentioned, however, that certain academic groups were already into ecosystem investigation and planning in the early 1970s at sites identified by the Caliraya Foundation and the University of the Philippines in Los Baños.)

The process is paralleled by the expanding role of NGOs: from their early predominantly relief and welfare service orientation to project proponent and

implementor; then community developer; and today, articulator of people's vision and political will and facilitator of empowerment.

These parallel processes derive from the evolution of the paradigm itself for economic development as expressed in various models: from the production-centered economic growth model with its variations of growth-plus-employment and growth-plus-equity; to a basic needs model; then to a people-centered community-based model; and an emerging life-flow and culture-centered, community-based model that shifts authority outward to the ecosystem and power inward to persons; the latter model springing from the failure of the preceding one to deliver equitable benefits from resources and to guarantee a better quality of life-flow in people and the environment.

The government's response to the environmental crisis has not shown any such resiliency or dynamism; in contrast, it is mixed, incoherent and thereby ineffectual. This is due, perhaps, not so much to lack of evolutionary force as to the inertia created by vested interests in government, with its overdependence on a bureaucracy, adherence to a growth-plus-employment model and attitude to the views of multilateral funding agencies such as the International Monetary Fund, the World Bank and the Asian Development Bank which may on occasion be part of the problem and not the solution.

Environmentalists in government agencies, like the Department of Environment and Natural Resources (DENR), have identified the following core strategies for sustainable development: integration of environmental considerations in decisionmaking; proper pricing of natural resources; property rights reform; establishment of an integrated protected areas system; rehabilitation of degraded ecosystems; strengthening of residuals management industry (pollution control); integration of population concerns and social welfare into development planning; inducement of growth in the rural areas; promotion of environmental education; and strengthening of citizens' participation and constituency-building.

One would think that the list, which carefully sidesteps some issues, would be entitled to some attention from the economic planners. As it is, the environmentalists in government found themselves at odds with the economic planners, who have not included an ecological dimension into the development framework. DENR presented to the Philippine Assistance Program (PAP) donors a package for US\$3 billion, 80% to be in loans, with government control stipulated. The unavoidable consequence is a partition of the aid pie instead of reorienting all development projects towards sustainability.

The 1987 Brundtland report on "Our Common Future" defined sustainable development as providing for the needs of the present without jeopardizing the needs of the future. The concept has been broadened in the Philippines to apply beyond physical sustainability and to include all the interconnected dimensions of the society/community. The Green Forum-Philippines document on sustainable development looks at the sustainability of a community in its multidimensional wholeness. It acknowledges the need to affirm a community's core psychospiritual and cultural identity; a structure of relational values integrating nature and society (expressed as social equity) and economics and ecology (expressed as ecologically sound activities); a system of governance that

optimizes the community's self-transformation through information feedback and cybernetic participation; and natural security understood to include nutritional intake, health care and an ecological infrastructure for maintaining a stable climate, clean air and water, fertile soil and uniform global standards.

As the Green Forum-Philippines sees it, as sustainability needs force, the acknowledgment of environment, not ideology, as the bottom line for survival, power shifts away from the state to people in the community. This shift throws into relief participation in equity and protection of natural resources as the twin factors for sustaining a society/community. What is required, in effect, is an evolution of authority from an ideology to an ecology and a devolution of power from state to people. And what is envisioned as the main function of NGOs is the empowerment of people and communities towards self-development and self-government. This advocacy is likely to arouse government suspicion because in the past, it has functioned in the service of ideological politics. But it is precisely in this area where empowerment as a function will call into play authentic tools that will set it apart from propaganda and thereby transform political practice as it is known today.

When it proceeds from an ecological consciousness, authority carries with it a different view of power. It sees power as the flow of life within a whole. As a concept, it is the polar opposite of the view of power as accumulation, for unnecessary accumulation deprives the people downstream. It is akin to the concept of wealth among the Kalingas in northern Philippines, which sees wealth in concrete terms as being able to feed many people and share a bountiful harvest. It also goes beyond the narrow view that identifies authority with the politicians in currency. It is the proper framework for NGO work.

As the end of the 20th century draws near, there is a major restructuring of development and power centers such as the European community, the Soviet Union and the United States-Canada-Japan matrix. The focus on the future as an information society gives ASEAN countries a tremendous opportunity to be the global center of life science. It is well-known that the region's biodiversity has no parallel. Locked within its tropical rainforests and coral reefs are information reserves.

If ASEAN can wake up to the fact that power is not more territory nor physical production but information and values, the end to the environmental crisis is in sight; we can explore our true potentials and be truly rich. Since ASEAN was established in Bali in the mid-1970s, it has been noted that economic complementation projects have been having difficulty taking off. Perhaps, the ASEAN NGOs can come together and succeed where the governments have failed. Within the specific framework of sustainable development, they can help set up an ASEAN academy of life sciences, to start with, and perhaps, use it as a basis for a more concrete transnational advocacy. There is a wealth of possibilities NGOs can explore as they network beyond the confines of governments and narrow development paths.

Closing Ceremonies

Coastal Resources Management: the Philippine Department of Agriculture's Fisheries Sector Program for 1990-1994*

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BACANI, S.C. 1991. Coastal resources management: the Philippine Department of Agriculture's Fisheries Sector Program for 1990-1994, p. 107-109. In T.-E. Chua and L.F. Scura (eds.) *Managing ASEAN's coastal resources for sustainable development: roles of policymakers, scientists, donors, media and communities*. ICLARM Conference Proceedings 30, 125 p. Department of Science and Technology; Department of Agriculture; Department of Environment and Natural Resources; and Department of Tourism, Philippines; and International Center for Living Aquatic Resources Management, Philippines.

Abstract

Philippine coastal areas are confronted with a burgeoning population, poverty, diminishing and devastated resources due to overexploitation, illegal fishing activities and pollution. To remedy these prevalent problems, the Fisheries Sector Program (FSP) for 1990-1994 is being undertaken by the Department of Agriculture for a comprehensive, integrated management of coastal resources and sustained development in the fisheries sector. Institutional and policy reforms by the government provide the framework for the program. The prominent ones are mobilization of local coastal communities, decentralization of management of nearshore fisheries and prevention of mangrove area conversion to aquaculture. Significant components of FSP include coastal zone management to rehabilitate the coastal environment and diversify livelihood opportunities for fishermen; resource and ecological assessments; and research and extension. Initially covering 12 priority bays in 17 provinces, the program explores the possibility of expansion and expects fruitful results with the technical assistance of nongovernmental organizations (NGOs).

*Speech delivered during the Closing Ceremonies of the ASEAN/US CRMP Policy Conference on Managing ASEAN's Coastal Resources for Sustainable Development on 6 March 1990 at the Hyatt Terraces, Baguio City, Philippines.

Thank you for inviting me to speak to you at the close of your conference on managing the region's coastal resources. I hope your discussions were thoughtful and productive. I also hope that the outcome of those talks, particularly as it impacts on a more effective management of our coastal areas, will be integrated into your programs quickly and immediately.

As Secretary of Agriculture, I am convinced that the concept of coastal resources management cannot be timelier or more necessary. The department's mandate is first defined by its responsibility to small farmers and fishermen, and it is on behalf of the latter that I say our interests—in wanting sound and productive coastal areas—coincide. The wise management of our seas and coastlines can only improve the lives and livelihood of small-scale fishermen. The sustainable productivity of our coastal areas, as premised on environmental preservation, will have long-term benefits for fisheries. Since these are major concerns of the Department of Agriculture, we wish to assure you of our cooperation and participation in your programs.

The problems which affect our coastal areas are daunting and urgent. The number of municipal fisherfolk has increased by an estimated 50% over the last ten years. This does not take into consideration the fact that most Philippine cities are coastal, and that there has been unprecedented migration, over the same period, into these urban areas. Immense pressure is, therefore, put on coastal resources and areas to support these concentrations of population.

In addition, environmental damage from overpopulation, pollution and illegal fishing activities has been widespread and intensive. About 70% of the country's coral reefs has been impaired. Of the original mangrove cover believed to have existed during the 1920s, only 35% remain. And of the Philippines' 400 major rivers, 50 are heavily polluted and 10 are virtually dead. As a result, pelagic and nearshore demersal fish stocks have dramatically declined. Fishermen's catches in four of the country's regions have decreased by an average of 42% over a ten-year period.

Of continuing grave concern to myself and the department is the fact that about 80% of municipal fishing families lives below the poverty line.

In order to address these concerns, the department has launched the Fisheries Sector Program (FSP) for 1990-1994. This is a comprehensive and integrated program for managing marine resources and sustaining long-term development in the fisheries sector. Its objectives are: (1) conservation and regeneration of aquatic resources; (2) protection and rehabilitation of the coastal zone environment, including marine habitats; (3) alleviation of poverty among municipal fishermen, particularly through diversification of their sources of livelihood; (4) intensification of aquaculture, but within ecological boundaries; and (5) inducement of commercial fishing away from overfished nearshore waters and into the 200-mile exclusive economic zone.

To establish a framework for the program, the government is undertaking several institutional and policy reforms. On the local government level, community-based initiatives are encouraged to rehabilitate and manage the coastal zone and to diversify livelihood for small-scale fishermen. Steps to decentralize the management and regulation of nearshore fisheries will ensure preferential use of municipal waters by small fishermen. In addition, policy is

being readied to prevent mangrove areas from being converted to fish and prawn farms.

Under the FSP, a total of US\$200 million will be invested in the next five years. Of particular interest to you would be the investment of \$33 million in coastal zone management (CZM); \$15 million in resource and ecological assessment; and \$25 million for research and extension.

The rehabilitation of coastal environments and livelihood diversification for fishermen are the two main and reciprocal goals of CZM. Component funds will be used for the: (1) establishment of fish sanctuaries and marine reserves; (2) construction of 500 km of artificial reefs and transplantation of corals; and (3) reforestation of 30,000 ha of mangrove areas. It is envisioned that fishermen will be recruited for these rehabilitation efforts, thereby providing them with an additional source of income. NGOs will be contracted to organize and train fishermen for this purpose. Likewise, alternative livelihood projects will be developed to draw fishermen into other economic activities, thus easing pressure on already overfished coastal waters.

Resource and ecological assessments will be undertaken to determine the viability of coastal areas. Under the research and extension component of the program, specific studies shall be conducted on such priorities as sea ranching and fish farming, artificial reefs, the red tide and tuna and cephalopod exploratory fishing. A comprehensive national fisheries research program will be handled by a network of upgraded research facilities.

The present program extensively covers 12 priority bays in 17 provinces. However, a 1988 study has identified at least eight other bays and ten other coastal areas equally in need of rehabilitation and management. Another \$200 million may be needed for these areas.

While it is difficult to quantify the benefits that would accrue to the areas targetted by the program, experiences in similar projects may provide some indications. In Lamon Bay, for example, where a comparable fisheries program was implemented, small-scale fishermen have reported a 75% increase--from P2,000 to P3,500--in their monthly incomes.¹ This was accomplished without overfishing and without causing trauma to the environment. The department hopes that the FSP for 1990-1994 will produce similarly happy results.

The department, of course, will continue to link up with NGOs such as ICLARM in monitoring and managing coastal resources. It pledges its continuing commitment to the Coastal Area Management Program and the Coastal Resources Management Project. The department also gratefully acknowledges the inputs these programs have contributed to its policy planning.

The poet Algernon Charles Swinburne calls the sea the "great mother"--no doubt alluding to its germinal and nurturing capabilities. The intelligent management of marine resources will allow us to maximize the sea's mothering capacity, so we may "go back to the great sweet mother, mother and lover of men, the sea."

¹June 1990: P23.07 = US\$1.00.

Background to the Baguio Resolution on Coastal Resources Management

In early 1986, the six members of the Association of Southeast Asian Nations (ASEAN)—Brunei Darussalam, Indonesia, Malaysia, the Philippines, Singapore and Thailand—began an international and collaborative effort to develop integrated coastal resources management plans. With the financial support of the United States Agency for International Development and the technical assistance of the International Center for Living Aquatic Resources Management (ICLARM), each country selected a coastal environment and began an intensive, interdisciplinary research program involving scores of university-based researchers, government officials and representatives from the private sector and nongovernmental organizations. The research was intended to gather baseline data, assess the state of the environment at the project site and suggest how best to manage the site so that its resources could be utilized to promote economic development and protection of the valuable coastal resources. Once the research was completed, attention turned to the formulation of comprehensive coastal resources management plans, most of which were completed in late 1989 and early 1990.

To emphasize the necessity for action in implementing these plans, an international conference on "Managing ASEAN's Coastal Resources for Sustainable Development" was held in Manila and Baguio City, Philippines, on 4 to 7 March 1990. ICLARM and the Government of the Republic of the Philippines sponsored the conference, which featured sessions on "Current Efforts in Coastal Resources Planning and Management"; "The Role of Political Leadership in Managing Coastal Resources for Sustainable Development"; "Providing Resources for Sustainable Development"; and "Community Awareness and Participation in Sustainable Development." Participants included key policymakers from each ASEAN country, technical experts from Asia, Europe and North America, and representatives of the media and international donor agencies.

Discussion repeatedly turned to recognition of the root causes of the problems in coastal areas and the urgent need to implement effective remedial measures. At the conclusion of the conference, the participants agreed to state both collectively and unequivocally the importance of focusing international attention on the plight and protection of ASEAN's coastal resources. The result of this agreement is the "Baguio Resolution on Managing ASEAN's Coastal Resources for Sustainable Development," which is found on the pages that follow. In

unanimously approving the resolution, official representatives from the six countries have provided a permanent and prominent demonstration of ASEAN's concern for and commitment to integrated social and economic management of coastal areas. In turn, international donor agencies have recognized the need to support integrated management programs designed to protect coastal resources, and media representatives have agreed to their essential role in promoting community awareness of these issues.

ASEAN has been in the forefront of many areas of international collaboration; the Baguio Resolution continues that tradition by providing the world's first multinational commitment to integrated coastal area planning and management.

Baguio Resolution on Coastal Resources Management

issued by

*The Policy Conference on Managing ASEAN's
Coastal Resources for Sustainable Development*

4-7 March 1990

Manila and Baguio, Philippines

WHEREAS, much of Southeast Asia's population lives in coastal areas, and the lives and reasonable aspirations for economic advancement of these coastal residents are inextricably linked to the sustained productivity of coastal resources; and coastal areas contain a diverse collection of natural resources within their interrelated ecosystems, and close linkages exist between these ecosystems and the socioeconomic systems in coastal areas; and fish and other aquatic resources are routinely captured and cultured in coastal areas, providing food, valuable chemicals and materials, employment and income for many coastal residents; and the region's unique coastal environments also provide many other economic opportunities for the private sector including oil, mineral and timber extraction, agriculture, shipping and tourism;

WHEREAS, many coastal environments within the Association of Southeast Asian Nations (ASEAN) have become seriously degraded, resource-use conflicts are escalating, and valuable coastal resources are being overexploited; and the result is that the productivity of these coastal areas has diminished, and the prospects for continued economic prosperity in the region has been jeopardized;

WHEREAS, to maintain and enhance the livelihood of coastal communities within the ASEAN, coastal areas must be managed for sustainable development; and as population and economic pressures on these coastal resources increase, it becomes more difficult and challenging to achieve sustainable development in coastal areas in the absence of proper management; and effective management of coastal areas requires that the ecological and socioeconomic interdependencies that characterize these areas be taken fully into account; and this can best be done through development and implementation of integrated coastal resources management plans;

WHEREAS, political leaders, and many groups and organizations have important roles in effective coastal resources management, and all of these can contribute to sustainable development; and government decisionmakers and the private sector can play a crucial role through their support of plan development and implementation, and their encouragement of coastal communities to act cohesively to enhance prospects for sustainable development of coastal areas;

and donor agencies can likewise contribute meaningfully in setting the course of development of coastal areas by ensuring that all sectoral projects funded are congruent with multisectoral development plans that are conducive to sustainable development of coastal areas; and the mass media are important in increasing public awareness regarding the importance of coastal resources and the dependence of continued prospects for economic development in coastal areas on proper management of coastal resources;

WHEREAS, recognizing the need for effective strategies to manage coastal resources for sustainable development, the ASEAN, through its various mechanisms, has undertaken a series of cooperative programs, particularly the ASEAN/US Coastal Resources Management Project; and under this project, the following activities have been undertaken by various national institutions coordinated by the International Center for Living Aquatic Resources Management:

- analysis, documentation and dissemination of information on how coastal resources are being developed for economic purposes;
- strengthening of existing management capabilities of local and national institutions within the region;
- provision of technical solutions to resolve conflicts arising from competing uses of coastal resources; and
- assistance to various organizations and agencies in the development of coastal area management plans;

WHEREAS, the Policy Conference on Managing ASEAN's Coastal Resources for Sustainable Development recognizes the accomplishments of the Coastal Resources Management Project;

THEREFORE, we the participants of the Policy Conference hereby resolve and further recommend that the ASEAN member countries, donor agencies and all other groups and organizations give emphasis to the protection of these resources for the primary benefit of coastal communities by:

- endorsing policies that promote and enhance sustainable development of coastal resources;
- encouraging the development and implementation of integrated, interdisciplinary and comprehensive coastal resources management plans;
- further strengthening management capabilities of governmental and nongovernmental organizations responsible for the management of coastal resources;
- undertaking measures to relieve human population pressures in coastal areas;
- implementing and rigorously enforcing effective regulations and supporting incentive schemes to promote sustainable uses of coastal resources;
- increasing awareness of coastal populations regarding their critical dependence on the continued productivity of coastal resources;
- promoting community-based participation in coastal area management;

- adopting policies and programs to enable women to participate in and contribute more actively to the effective management of coastal resources for sustainable development;
- exploring ways and means by which the public and private sectors can cooperate and thereby benefit from efforts to sustain and develop coastal resources; and
- considering in coastal area management, the implications of possible climate change and sea level rise.

ADOPTED by acclamation in Baguio City, Philippines, on 6 March 1990.

Appendices

List of Participants, Resource Persons and Observers

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Ministry of Science, Technology
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State Government of Johore

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Media

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 Volunteer
 US Peace Corps
 Philippines

Mr. Joel B. Guevarra
 San Miguel Corporation
 Philippines

Program of Activities

Sunday, March 4
 Manila Hotel, Manila
 P.M.

Opening Ceremonies

Address: ASEAN's Efforts in Managing Coastal Resources for Sustainable Development. *Dr. Aprilani Soegiarto*

Address: Responding to the Challenges of Coastal Resources Management in ASEAN. *The Honorable Ceferino L. Follosco*

Keynote Address: Sustainable Development of Coastal Resources: A Challenge and a Choice. *The Honorable Catalino Macaraig*

Master of Ceremonies: *Dr. Rafael D. Guerrero III*

Dinner reception hosted by the Philippine Departments of Science and Technology, Agriculture, Environment and Natural Resources, and Tourism

Monday, March 5
 Hyatt Terraces, Baguio
 A.M.

Depart Manila on PAL Flight to Baguio

Registration

Welcome Remarks: *The Honorable Jaime Bugnosen*, Mayor, City of Baguio

Keynote Address: The Value of Coastal Resources in National Economic Development. *His Excellency Chuan Leekpai*

Session 1: Current Efforts in Coastal Resources Planning and Management

Chairman and Moderator: *Dr. Aprilani Soegiarto*

Managing Coastal Resources for Sustainable Development: The ASEAN Initiative. *Dr. Chua Thia-Eng*

Discussion

Discussants: *The Honorable Rafael Colet*, *Dr. Abu Bakar Jaafar* and *Haji Matdanan bin Haji Jaafar*

P.M.

Luncheon hosted by Office of the Mayor, City of Baguio

Session 2: The Role of Political Leadership in Managing Coastal Resources for Sustainable Development

Chairman: *The Honorable Ceferino L. Folloso*

Building a New International Consensus. *Mr. M.S. Kismadi*

The Need for an Integrated Coastal Zone Management in the Philippines. *The Honorable Fulgencio S. Factoran, Jr.*

The Role of Environmental Protection and Coastal Resources Management in National Development Planning in Thailand. *Mr. Kirasak Chancharaswat*

Reconciling Economic Development with Environmental Protection in Malaysia. *The Honorable Datuk Amar Stephen K.T. Yong*

Discussion

Moderator: *Dr. Richard J. Tobin*

Discussants: *The Honorable Heherson Alvarez* and *The Honorable Dr. Surin Pitsuwan*

Dinner hosted by ICLARM

Tuesday, March 6

Hyatt Terraces, Baguio

A.M.

Session 3: Providing Resources for Sustainable Development

Chairman: *The Honorable Fulgencio S. Factoran, Jr.*

Evolution of the World Bank's Environmental Policy. *Mr. Jeremy Warford*

The Asian Development Bank's Efforts in Sustainable Development of Coastal Resources. *Dr. Bindu Lohani*

Coastal Resources Management: The Singapore Experience. *The Honorable Dr. Ahmad Mattar*

Discussion

Moderator: *The Honorable Celso R. Roque*

Discussants: *The Honorable Leticia R. Shahani* and *Ms. Jeannie Peterson*

P.M.

Luncheon hosted by San Miguel Corporation

Session 4: Community Awareness and Participation in Sustainable Development

Chairman: *The Honorable Tan Sri Haji Muhyiddin bin Haji Mohd. Yassin*

The Role of the Local Press in Creating Public Awareness of Coastal Resources Management. *Mr. Philip Mathews*

Mobilizing Community Awareness: The Lingayen Gulf-Agoo Setting, Philippines. *The Honorable Pablo M. Olarte*

The Role and Involvement of Nongovernmental Organizations in the Sustainable Development of Coastal Resources. *Mr. Maximo T. Kalaw, Jr.*

Discussion

Moderator: *Mr. David McCauley*

Discussants: *Dr. Chia Lin Sien* and *The Honorable Jerome V. Paras*

Baguio Resolution on Coastal Resources Management

Closing Ceremonies

Address: Coastal Resources Management: The Philippine Department of Agriculture's Fisheries Sector Program for 1990-1994. *The Honorable Senen C. Bacani*

Dinner hosted by the Provincial Governments of Pangasinan and La Union

Wednesday, March 7

A.M.

Return to Manila or optional field trip to Lingayen Gulf

ICLARM PUBLICATIONS ON COASTAL AREA MANAGEMENT

Conference Proceedings

Towards sustainable development of the coastal resources of Lingayen Gulf, Philippines. G. Silvestre, E. Miclat and T.-E. Chua, editors. 1989. No. 17, 200 p. US\$9 surface; \$15 airmail.

Coastal area management in Southeast Asia: policies, management strategies and case studies. T.-E. Chua and D. Pauly, editors. 1989. No. 19, 254 p. \$9 surface; \$15 airmail.

Towards an integrated management of tropical coastal resources. L.M. Chou, T.-E. Chua, H.W. Khoo, P.E. Lim, J.N. Paw, G.T. Silvestre, M.J. Valencia, A.T. White and P.K. Wong, editors. Forthcoming. No. 22.

Urban coastal area management: the experience of Singapore. L.S. Chia and L.M. Chou, editors. Forthcoming. No. 25.

Coastal area management education in the ASEAN region. T.-E. Chua, editor. Forthcoming. No. 29.

Managing ASEAN's coastal resources for sustainable development: roles of policymakers, scientists, doctors, media and communities. T.-E. Chua and L.F. Scura, editors. 1991. No. 30, 125 p. \$9 surface; \$15 airmail.

Technical Reports

The coastal environmental profile of Brunei Darussalam: resource assessment and management issues. T.-E. Chua, L.M. Chou and M.S.M. Sadorra, editors. 1987. No. 18, 194 p. \$2 surface; \$10 airmail.

The coastal environmental profile of Ban Don Bay and Phangnga Bay, Thailand. J.N. Paw, S. Bunpaong, A.T. White and M.S.M. Sadorra, editors. 1988. No. 20, 79 p. \$1 surface; \$5 airmail.

The coastal environmental profile of Singapore. L.S. Chia, H. Khan and L.M. Chou. 1988. No. 21, 92 p. \$1 surface; \$5 airmail.

The coastal environmental profile of Lingayen Gulf, Philippines. L.T. McManus and T.-E. Chua, editors. 1990. No. 22, 69 p. \$1 surface; \$5 airmail.

The coastal environmental profile of South Johore, Malaysia. T.-E. Chua, K.L. Ch'ng and A.B. Jaafar, editors. Forthcoming. No. 24.

The coastal environmental profile of Segara Anakan-Cilacap, South Java, Indonesia. A.T. White, P. Martosubroto and M.S.M. Sadorra, editors. 1989. No. 25, 82 p. \$1 surface; \$5 airmail.

Directory

Directory of institutions and scientists in the ASEAN region involved in research and/or management related to coastal areas. T.-E. Chua, M.A.A. Agulto, F.Y. Guarin and S.C. Guerrero, compilers. 1989. No. 1. \$2 surface; \$10 airmail.

Mail orders and inquiries to:

- International Specialized Book Services, P.O. Box 1632, Beaverton, Oregon 97075, USA (for North America). Airmail price must be used.
- S. Toeche-Mittler GmbH, Versandbuchhandlung, Hindenburgstrasse 33, D-6100 Darmstadt, Federal Republic of Germany (for Europe). Airmail price must be used.
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