



T H E   C O M M O N   M E T H O D O L O G Y   F O R   L E A R N I N G

ECUADOR'S PIONEERING INITIATIVE  
*in* INTEGRATED COASTAL MANAGEMENT

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*The opinions expressed in this report are those of the authors and do not necessarily represent the views of the Inter-American Development Bank or its Board of Executive Directors.*

# ACRONYMS

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*CLIRSEN* . . . . . *The Military Cartographic Institute*

*CRC* . . . . . *Coastal Resources Center of the University of Rhode Island*

*DIGMER* . . . . . *The Navy Merchant Marine Directorate (Includes Port Captains)*

*ESPOL* . . . . . *The Polytechnic University of the Coast*

*IDB* . . . . . *Inter-American Development Bank*

*INP* . . . . . *National Fisheries Institute*

*PMRC* . . . . . *Coastal Resources Management Program*

*SIDA* . . . . . *Swedish International Development Authority*

*UCV* . . . . . *Ranger Corps*

*USAID* . . . . . *United States Agency for International Development*

*VECEP* . . . . . *Artisanal Fisheries Program (Funded by the European Union)*

*ZEM* . . . . . *Special Area Management Zone (Zona Especial de Manejo)*

# PREFACE

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THIS DOCUMENT DRAWS UPON AN EXTERNAL MID-TERM PERFORMANCE EVALUATION (CARL BRO AND ASSOCIATES, 1999) OF ECUADOR'S PROGRAMA DE MANEJO DE RECURSOS COSTEROS (PMRC) AND A PARALLEL GOVERNANCE CAPACITY ASSESSMENT (OLSEN ET AL, 2000). IT LINKS THE RECENT EXPERIENCE OF ECUADOR'S COASTAL MANAGEMENT PROGRAM TO THE INTER-AMERICAN DEVELOPMENT BANK'S 1998 STRATEGY FOR COASTAL AND MARINE RESOURCES MANAGEMENT AND TO THE ANALYTICAL FRAMEWORKS BEING DEVELOPED THROUGH THE COMMON METHODOLOGY FOR LEARNING INITIATIVE. THE LATTER IS A MULTI-DONOR EFFORT THAT IS WORKING TO PROMOTE THE DOCUMENTATION, ANALYSIS AND DISSEMINATION OF EXPERIENCE IN THE PRACTICE OF COASTAL MANAGEMENT WORLDWIDE. THE PREPARATION OF THIS DOCUMENT WAS FUNDED BY THE INTER-AMERICAN DEVELOPMENT BANK. THE SWEDISH INTERNATIONAL DEVELOPMENT AUTHORITY AND THE U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT HAVE CONTRIBUTED TO THE COSTS OF PRODUCTION AND DISSEMINATION OF THE REPORT AS AN EXPRESSION OF THE COMMON METHODOLOGY FOR LEARNING.

# ABSTRACT

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ECUADOR'S PROGRAMA DE MANEJO DE RECURSOS COSTEROS (PMRC) WAS THE FIRST NATIONAL COASTAL MANAGEMENT PROGRAM TO BE SUPPORTED BY A LOAN FROM THE INTER-AMERICAN DEVELOPMENT BANK. THE LOAN PROVIDES FUNDS FOR THE IMPLEMENTATION PHASE OF A PROGRAM INITIATED THROUGH PLANNING GRANTS PROVIDED BY THE U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT. THE PMRC'S INSTITUTIONAL DESIGN CALLS FOR POLICY REFORM AND INTERAGENCY COLLABORATION AT THE NATIONAL LEVEL THROUGH AN INTERMINISTERIAL COMMISSION. THE PROGRAM'S LEAD AGENCY IS THE OFFICE OF THE PRESIDENT. ALONG THE COAST EFFORTS ARE FOCUSED ON FIVE ZONAS ESPECIALES DE MANEJO WHERE PRIORITIES IN BOTH DEVELOPMENT AND CONSERVATION ARE BEING ADDRESSED THROUGH TECHNIQUES THAT EMPHASIZE INITIATIVE AND RESPONSIBILITY AT THE COMMUNITY LEVEL. MANAGEMENT PRACTICES, TAILORED TO THE ECUADORIAN CONTEXT, THAT ADDRESS MANGROVE CONSERVATION, ARTISANAL FISHERIES, SHOREFRONT DEVELOPMENT AND COASTAL-DEPENDENT MICROENTERPRISES ARE RIPE FOR REPLICATION ELSEWHERE ALONG THE COAST.

Figure 1.

Map highlighting the coastal provinces.



# 1.

## *THE IMPORTANCE of ECUADOR'S COASTAL REGION*

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In 1998, the Inter-American Development Bank (IDB) published a coastal and marine strategy (Lemay et al, 1998) that documents the significance of coastal and marine environments in Latin America and the Caribbean and details principles and strategies for the Bank's investments in their conservation and development. This paper explores Ecuador's coastal management program – the Programa de Manejo de Recursos Costeros (PMRC) – as an initial experiment in the application of this strategy. The PMRC was the first national coastal management initiative to be supported by an IDB loan and its experience offers valuable lessons on making the Bank's goals and principles an operational reality.

Ecuador's coastal region, when defined to include the four provinces that contain the coastal tier of watersheds and associated estuaries of the continental coast, is the fastest growing region of Ecuador. The fifth coastal province, the Galapagos Islands, is also under enormous development pressures. Ninety-seven percent of the Galapagos are within a national park and the province has a unique administrative structure. Because of this, and the logistical difficulties of operating in the Islands, the PMRC has elected to postpone the integration of the Galapagos into its activities until a second-generation effort gets underway.

Ecuador's economy rests upon the nation's rich endowment of natural resources. Petroleum, a non-renewable resource concentrated in the Amazon region, has been the most important contributor to the gross national product (GNP) since the 1960s. Ecuador's second and third largest exports, bananas and shrimp, are both coastal products. The nation's industrial banking and service industries are all concentrated in Guayaquil, the nation's largest and fastest growing city at the head of the Guayas estuary.

The continental coast has been transformed over the past 50 years by rapid population growth, urbanization (Figure 2), and the conversion of all but small remnants of once extensive forests into pastures and croplands. The process of change to the shoreline itself was triggered in the late 1960s by a boom in shrimp farming that has reconfigured estuaries and their associated mangrove wetlands in all but the most inaccessible reaches of the northernmost coast. In the 1980s and 1990s, an expanding highway network opened formerly inaccessible and isolated coasts to tourism and residential developments that are likely to bring social and environmental changes as significant as those brought by shrimp mariculture.

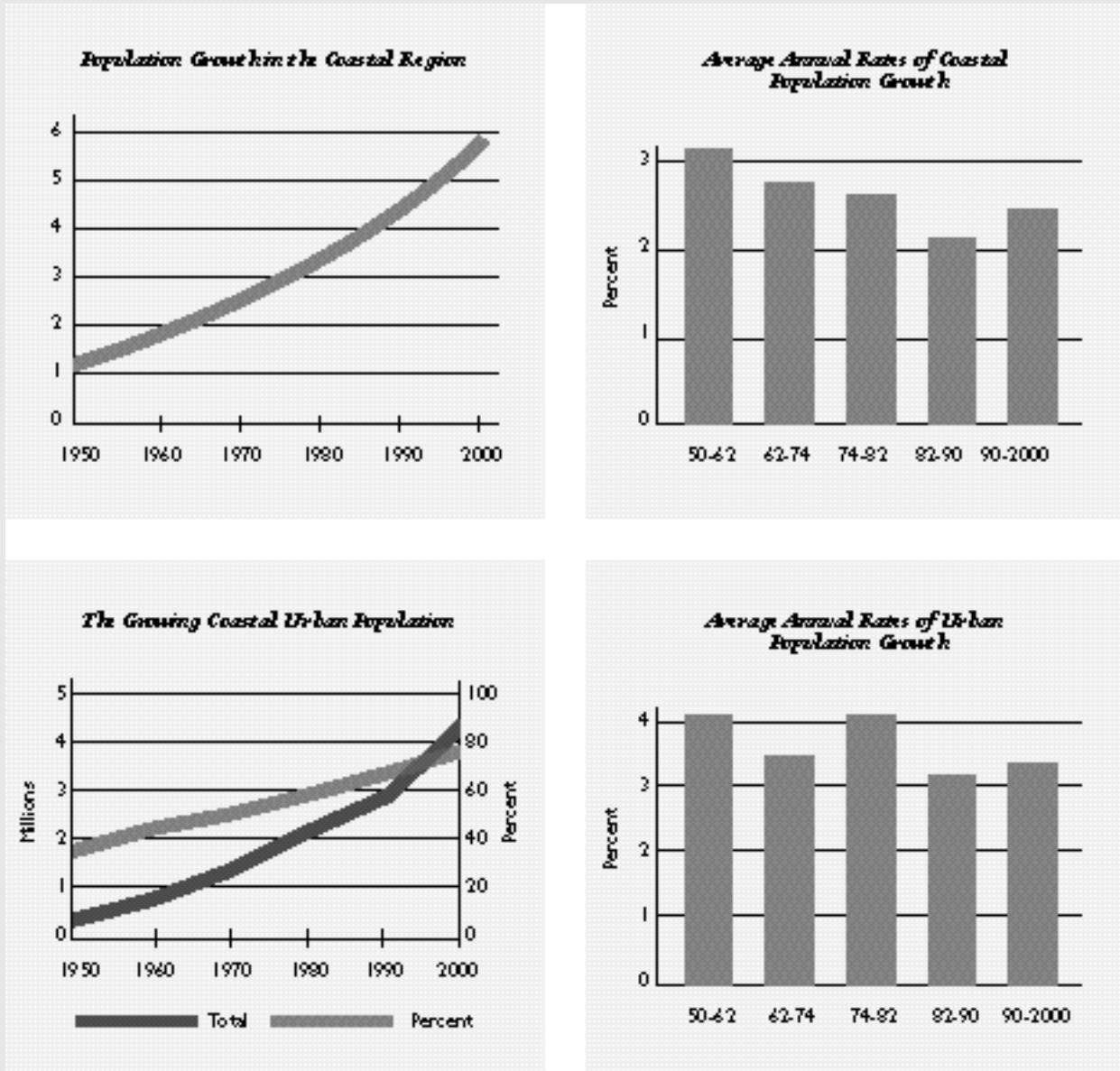
Because of massive, uncoordinated and often largely unplanned investments in such sectors as transportation infrastructure, mariculture, and most



Figure 2.

**Population Growth and Urbanization in the Coastal Region.**

*The coastal region is defined as four continental provinces with ocean coastlines:  
Esmeraldas, Manabi, Guayas and El Oro.*



Source: INEC, Censos Nacionales de Poblacion

recently tourism, the environmental qualities of coastal ecosystems upon which such activities depend are being rapidly degraded. Such new activities compete for access to the same natural resources and environmental activities upon which coastal communities traditionally depend. In Ecuador, as in other countries in the region, the absence of clear property rights and effective management regimes results in the misuse and overuse of fishery resources, coastal lands, beaches, estuaries and mangroves. These trends in increased competition and degraded environmental qualities result in mounting social conflicts and at times civil unrest.

The nation's reliance upon its endowment of natural resources and ecosystem qualities has been recognized by a succession of governments and numerous laws. A long sequence of laws, decrees and programs extending back to the 1950s have been designed to control deforestation and soil erosion, unplanned urban expansion, water quality degradation, and the overexploitation of fisheries. Unfortunately the poor implementation of these initiatives has too often had only a marginal effect on long-term trends of misuse and overuse of the nation's endowment. It was in full recognition of these trends and the limited effectiveness of previous natural resource management initiatives that the coastal management program was designed. Drawing from experience in other countries, the approach has been to design a management process that is implemented incrementally through steps judged to be within the capacity of the institutions involved at the time. A major emphasis has been placed on involving those affected in the analysis of the issues and framing of solutions and in experi-

menting with new approaches at a pilot scale before recommending national reforms. Five coastal management issues have been addressed:

- Destruction of mangrove wetlands
- Decline of nearshore fisheries
- Opportunities for sustainable mariculture
- Inappropriate shorefront development
- Declining coastal water quality and inadequate environmental sanitation

These issues are closely interrelated and require an overtly cross-sectoral approach to problem solving and resource management (see Robadue ed., 1995).

## 2.

# THE BANK'S STRATEGY for COASTAL and MARINE MANAGEMENT

As stated in the Bank's strategy (LeMay et al, 1998), the goal of coastal and marine resource management is:

*To improve the quality of life of communities that depend on coastal and marine resources and increase the contributions of these resources to national economic welfare while maintaining the biological biodiversity and productivity of coastal marine ecosystems.*

To advance this goal, the Bank is supporting programs that:

- Promote the participation of stakeholders in all phases of the management process
- Build consensus on management priorities, good practices and the distribution of responsibility among all those participating in a management process
- Foresee and prevent conflicts and avoidable losses in environmental quality
- Support the establishment of institutions that facilitate the efficient and equitable allocation of coastal resources
- Create incentives for effective management practices.

This combination of actions is fully consistent with the fundamentals of the 8th Capital Replenishment with its emphasis on promoting sustainable forms of development that embrace the principles of participation and transparency and the role of governments as the stewards of common property assets.

The growing body of international experience in coastal management reinforces the reality that achieving such goals as improved quality of life for

### Box 1.

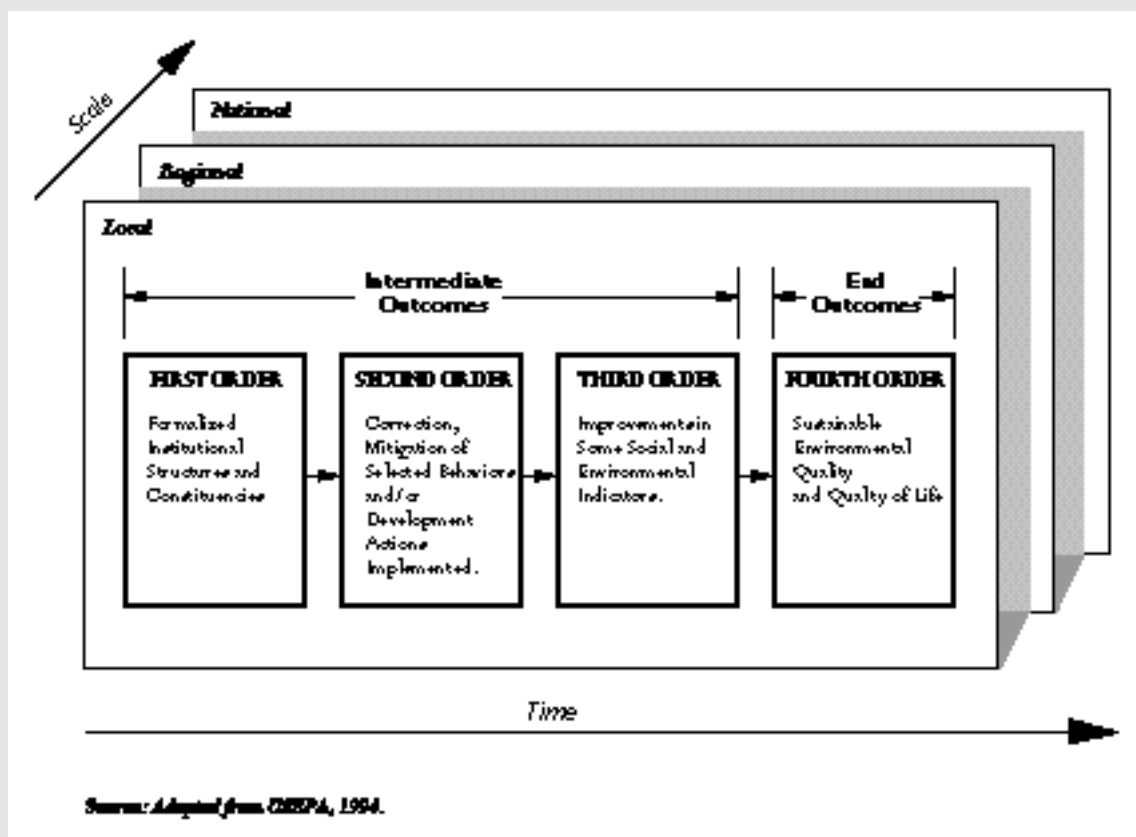
#### The Defining Features of Integrated Coastal Management (GESAMP, 1996)

A continuous and dynamic process that unites government and the community, science and management, and sectoral and public interests in preparing and implementing an integrated plan for protection and development of coastal ecosystems and resources.

coastal communities while maintaining biological productivity and biodiversity in populated coastal regions requires efforts that must be sustained over many decades. As shown in Figure 3, such sustained efforts progress through a sequence of outcomes. While measurable improvements in some social and environmental indicators (Third Order Outcomes) may be achieved under favorable conditions at the community level in a decade or less, achieving such outcomes at a national scale, particularly where coastal ecosystems are already

Figure 3.

Ordering coastal governance outcomes



severely degraded and there is widespread poverty, requires a larger and more protracted effort. In Ecuador, important institutional goals and formalized mandates for improved coastal management (First Order Outcomes) have been achieved at the national scale. The necessary development actions and documentable changes in societal behavior (Second Order Outcomes) are thus far largely limited to the pilot sites (Zonas Especiales de Manejo, or ZEM) where the program has focused its management efforts. The achievement

of Second Order Outcomes at a national scale – such as a cessation of mangrove cutting, sound shorefront development practices and the control of activities that result in the downward spiral of water quality – all lie off in the future. The program’s long-term strategy is to identify the most effective methods for achieving the required changes in group behavior by experimenting in the pilot sites and then replicating these approaches coast-wide. (See also IWICM, 1996.)

### 3.

## THE EVOLUTION of the PMRC

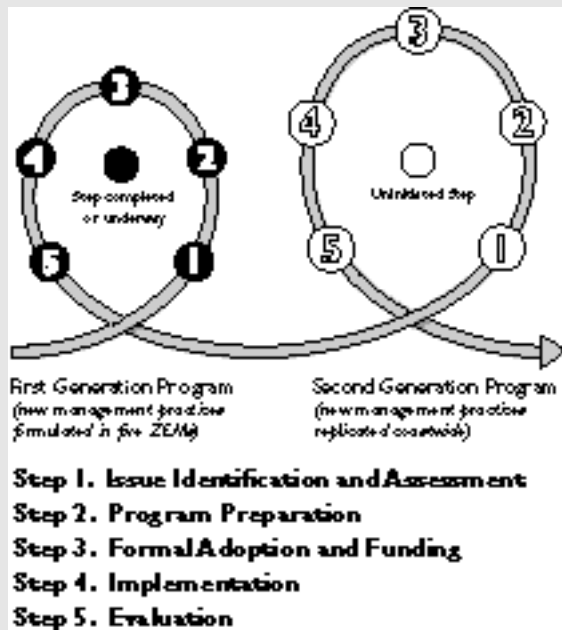
Costa Rica, Ecuador and Barbados have all been pioneers in Latin America and the Caribbean in applying the principles of coastal management to their specific needs. Their approaches have been quite different. In the 1960s, Costa Rica adopted legislation that created a strip of shorefront 150-meters wide outside the boundaries of municipal governments in which construction is prohibited and public access is guaranteed. This “zona publica” is backed up by a 350-meter wide zone in which construction may occur with a special permit. Costa Rica’s coastal law was designed primarily to promote coastal tourism and it is administered by its Institute of Tourism (see Sorensen, 1990). Beginning in the late 1980s, Barbados

began developing a program designed to address coastal erosion and shorefront construction issues along the segment of the coast of the island where tourism infrastructure is concentrated. The Barbados program has gradually added other issues to its agenda and now takes a comprehensive approach to shorefront planning and management and will ultimately address the island as a whole. In the 1990s, several other countries in the region, including Mexico, Colombia, Peru, Brazil and Chile, began experimenting with a range of sector-specific and integrated approaches to coastal management. Today most of these new initiatives are in the issue analysis and planning phase of program development.

The importance of Ecuador’s coastal region and the need for more effective management of its resources was first recognized and discussed at a workshop sponsored by the Ecuadorian Navy and the United Nations in 1981. Four years later, Ecuador was selected by the United States Agency for International Development (USAID) as one of three pilot programs designed to test the usefulness of applying lessons learned from coastal management initiatives in the United States to similar problems and opportunities in developing countries (Olsen et al., 1998). The USAID-sponsored phase continued through 1993 when the Government of Ecuador identified as a priority for IDB funding the implementation of the policies and action agendas detailed in the five ZEM plans that had been formulated. The Bank’s first loan in support of a coastal management program was subsequently negotiated with the Government of Ecuador in 1993. However, the preconditions to

Figure 4.

#### The Policy Cycle Showing First and Second Generations of Coastal Management in Ecuador (from Olsen et al., 1998)



## Box 2.

### The Evolution of Ecuador's First Generation of Coastal Management

#### Step 1. Issue Identification and Assessment, 1981-1988

- Workshop on coastal development, trends and issues sponsored by the Ecuadorian Navy and United Nations (1981)
- USAID-supported planning and policy formulation phase begins (1986)
- International symposium and analysis of factors affecting the sustainability of shrimp mariculture (1986)
- Public workshops and expert meetings produce a profile of the development trends and issues in the coastal region (1988)

#### Step 2. Preparation of a Plan/Program, 1989-1992

- A widely circulated proposal and manifesto outlines the institutional structure and strategies for a national coastal management program (1988)
- Executive Decree 375 endorses the proposal and creates an interministerial commission to oversee a planning process in five special area management zones (1989)
- First Ranger Corps (UCVs) begins joint enforcement/monitoring operations
- Plans for the special area management zones prepared at the community level: national policy reforms recommended (1989-1992)

#### Step 3. Formal Adoption and Funding, 1992-1993

- Special Area Management Plans formulated and approved at community level and endorsed by the National Coastal Commission (1992)
- Executive Decree 3399 adjusts the institutional framework for the implementation phase (1992)
- IDB loan for Special Area Management Plan implementation and institutional strengthening negotiated (1993)

#### Step 4. Implementation, 1996-2001

- Delay caused by preconditions to loan disbursement halts activities for nearly three years
- Implementation of Special Area Management Plans and institutional strengthening activities (1996-2001) underway

#### Step 5. Evaluation

- Annual self-assessments and work plans (1986-onwards)
- Mid-term evaluation of the IDB loan (1999)
- Assessment of issues and PMRC's governance capacity provides guidelines for a second generation program (1999-2000)

the loan were not met until 1996 when the initial implementation phase of the program formally got underway. This initial phase of implementation is scheduled to end in 2000. Major events in the evolution of the PMRC are shown in Box 2. A second-generation program, that is expected to address additional issues and larger segments of the coast, may be supported by a future IDB loan.

While Figure 3 arrays the outcomes of coastal management into a logical sequence extending over many decades, the mechanics of the shorter term evolution of a program is best visualized as successive completions of the policy cycle. At this more immediate time scale, a coastal management program evolves through a sequence of steps that begin with issue identification, proceed through planning and then formalized commitment to securing the funds required to implement the program's policies. Then comes a period of program

implementation and evaluation. Completion of all five steps can be termed a "generation" of a coastal management program (Figure 4). Because the environmental and social issues confronted by coastal management initiatives are numerous, complex and rapidly evolving and because the geographic areas are often large, coastal management initiatives that are successfully sustained and become a permanent feature of a country's governance structures typically evolve through a sequence of generations. Ideally, each succeeding generation moves a program towards Third Order Outcomes in a larger geographic area or addresses additional issues. The first generation of coastal management in Ecuador will extend over a 15-year period. Coastal management programs in other developed and developing countries that operate at comparable geographic scales, have required similar periods to advance through an initial cycle—or generation—of management.

# 4.

## *SUCCESSSES and DIFFICULTIES in FORMULATING NEW STRUCTURES for COASTAL MANAGEMENT*

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A defining feature of Ecuador's program is that it has been structured to build constituencies and management capacity simultaneously at both the community level and within central government. This can be termed the two-track, or co-management, approach. This two-track structure is shown in diagrammatic form in Figure 5.

### *Track One: Management Structures at the National Level*

In 1989, an Executive Decree placed the PMRC within the Dirección de Administración Pública (Directorate of Public Administration) in the Office of the President of the Republic. The Secretary of the Directorate chairs the Comisión Nacional para el Manejo de Recursos Costeros (National Coastal Resources Management Commission). The Comisión Nacional is charged with developing national policy on coastal issues and promoting collaboration among the governmental agencies with responsibilities over the major coastal activities and coastal resources. The Comisión Nacional approves annual work plans and community-level coastal management plans. The PMRC is administered by a head office in Guayaquil, the major coastal city. A second Executive Decree in 1993, designed to adjust the program structures for the administration of an IDB loan, provides for a diversified staff in the head office as a Dirección Ejecutiva (Executive Directorate).

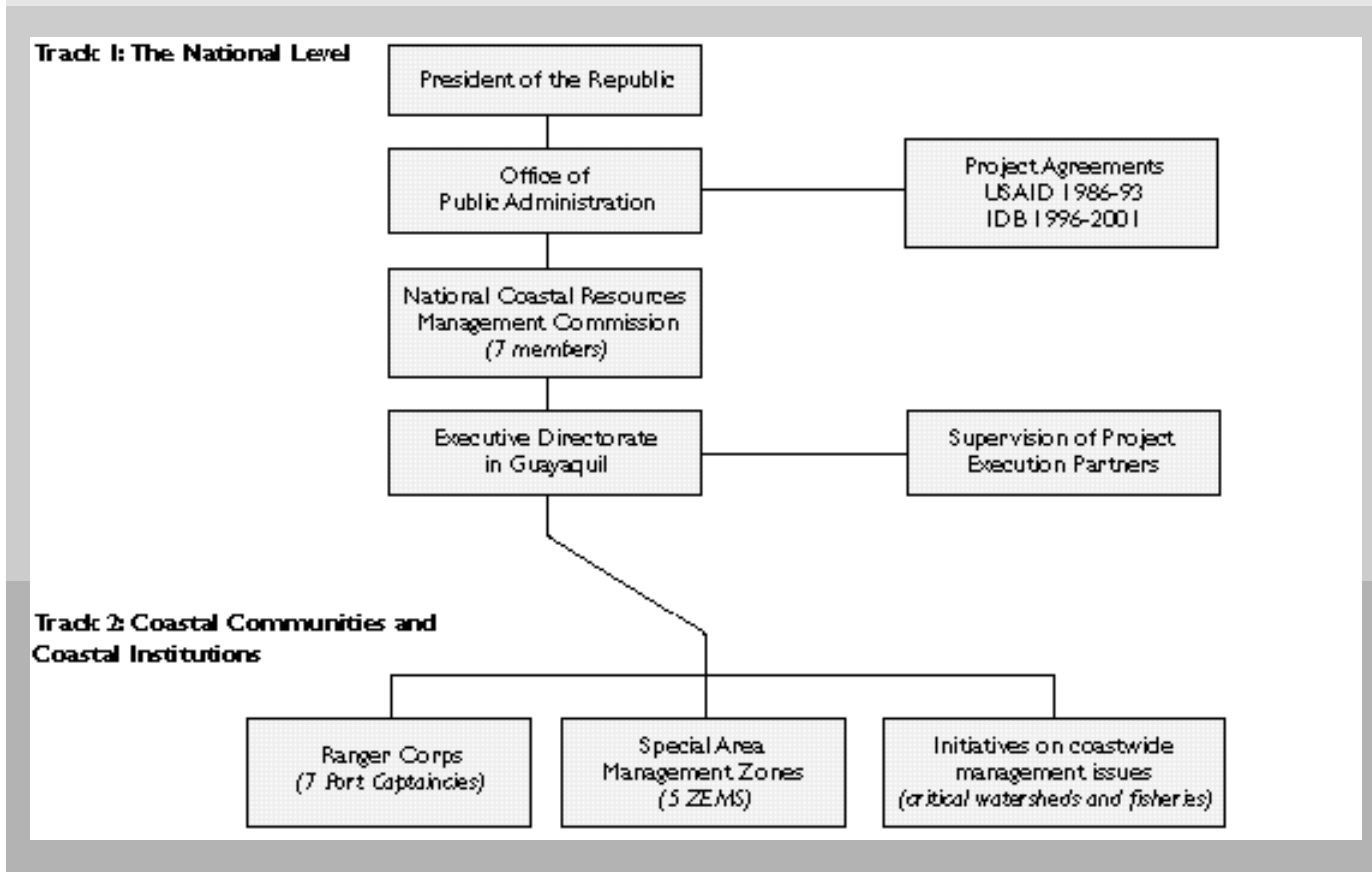
### *Track Two: Coastal Communities and Coastal Institutions*

The ZEMs established by the 1989 Decree range across rural to urban settings. One ZEM, an as-yet-undefined portion of Galapagos province, has remained inactive following a 1990 analysis of management issues and options in the Islands. Thus, the first generation program has focused on resolving management issues in the five mainland ZEMs and developing institutional mechanisms for coordinated action among national agencies with coastal responsibility. The preparation and the implementation of plans that address priorities for conservation and development in each of the five mainland ZEMs has featured a highly participatory process that strives to involve all major stakeholders in a comprehensive planning and decisionmaking process.

A second feature of the second track is the Unidades de Conservación y Vigilancia (UCVs), a Ranger Corps that draws together local level governmental administrative and enforcement officers. The UCVs conduct joint patrols, collaborate on enforcement and permit-granting actions, and work together to monitor changes in the condition and use of the coast's resources. Today, there are seven UCVs along the mainland coast, each of which is led by a port captain of the Marina Mercante, Ecuador's equivalent of a Coast Guard.

Figure 5.

Institutional Structure of the PMRC



*A Decentralized and Adaptive Approach to Management*

The PMRC’s institutional design provides for an incremental, overtly experimental approach to coastal management—one that works to test new management practices at a small scale before applying them more broadly. The program addresses priorities for both development and conservation in geographic sites selected as pilots for the application of management techniques that emphasize initiative and responsibility at the community level. Once they have proved to be effective, they will be replicated in other coastal areas.

The defining features of the PMRC’s administrative structure emerged from two years of institutional

analysis and an intensive series of public meetings and consultations with government officials and private sector representatives. The conclusions and recommendations from this process (Box 3) were set forth in a document widely circulated in 1988, entitled, “Structure and Objectives of the Coastal Resources Management Program for Ecuador” (Matuszeski et al, 1998). The management principles and the resulting governance structures were subsequently reflected in a manifesto circulated by a local NGO, Fundacion Maldonado, that was signed by political, private sector, academic and church leaders during the 1988 political campaign. The two Executive Decrees that provide the legal basis for the PMRC are also consistent with the approach outlined in the manifesto.



### Box 3.

#### Findings That Guided the Design of the PRMC

- The focus of the program must be on issues and conflicts that are truly coastal in nature; that is, in matters related to the sea and the adjacent land areas.
- There is no massive critical problem or problems common to all coastal areas. Rather, there are specific issues and problems in each sector of the coast, and in some identifiable geographic areas where serious conflicts among users are either present or likely to emerge in the near future if no action is taken.
- There are already in place sufficient laws and authorities to properly manage coastal resources. There are many overlapping areas of jurisdiction in government entities. New laws are not necessary. What is required is better coordination and enforcement of existing legislation.
- There is a general lack of knowledge on the part of public officials of the precise nature and extent of the laws they seek to carry out. There is also a serious shortage of adequately trained enforcement personnel in nearly all agencies. Their salaries and logistic support are inadequate.
- The private sector does not have a high level of confidence in the ability of the government to simplify procedures, expedite decisions, or enforce regulations on coastal resources.
- An important element of coastal resources management must be an extensive education program at all levels to create a civic consciousness about coastal resources and the critical role they will play in the future of Ecuador.
- The adequate management of the different areas will require several administrative levels in order to be effective.
- Recognition and support of the management programs must come from presidential and ministerial levels.

*Adapted from "Structure and Objectives of a Coastal Management Program for Ecuador" (1988)*

## 5.

# *THE EMERGING EXPERIENCE in IMPLEMENTING NEW FORMS of COASTAL MANAGEMENT*

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It is important to recognize that the PMRC has had to adapt to major internal and external perturbations as it has negotiated the transition between an initial phase of planning (Steps 1-3 of the policy cycle) to an initial phase of implementation (Step 4). Internal changes were brought by the transition from a project funded by the USAID and administered by the Coastal Resources Center of the University of Rhode Island to a program funded by an IDB loan and administered by the Government of Ecuador. This transition was further complicated by difficulties in meeting the Bank's preconditions to loan disbursement. This brought most program activities to a halt for nearly three years. During this time there were also major changes in Dirección Ejecutiva staff and modifications to the program's procedures. There have been five Executive Directors between 1993 and 1999. These shifts in leadership have resulted in protracted periods of uncertainty and inaction within the Dirección Ejecutiva.

These internal changes have been overshadowed by, and are a result of, a period of great political turmoil in Ecuador. During this same period, the country has suffered a prolonged and profound economic crisis marked by rampant inflation and the failure of many banks. Ecuador has fought a war with Peru, forced the resignation of two presidents, and lived through the disruptions brought

by severe El Niño floods, a major earthquake in Manabi province and, most recently, volcanic eruptions. These events have consumed the attention of the lead agency for the program, the Office of the President, and have competed for the attention of the members of the Comisión Nacional. It is remarkable that the program has been able to advance its agenda in such turbulent times.

### *Improved Coastal Governance in Track One*

**Program Administration.** During the grant-funded planning phase, the PMRC was administered through a Project Office led by co-directors with equal authority. The national co-director was appointed by the Government of Ecuador while the U.S. director represented the University of Rhode Island's Coastal Resources Center. The co-directors framed annual work plans and jointly approved all major administrative decisions including the selection of personnel and annual budget allocations. Each annual work plan was based upon a self-assessment at which all those involved in the program reported on progress and problems in each element of the program, discussed lessons learned and set priorities for the next year's work plan. These arrangements produced a set of checks and balances that produced a transparent and inclusive approach to decisionmaking and a strong sense of shared purpose among all those

participating in the program both at the community level and at Track One.

In 1994, the Project Office became the Executive Directorate led by an Executive Director appointed by the Office of the President. Through a technical cooperation grant, the Bank provided funds for hiring a larger administrative and technical staff and putting in place the financial and personnel systems for administering the \$12.7 million dollar loan. In the absence of funds for implementation activities in the ZEMs between 1993 and 1996, the largely new staff in the Dirección Ejecutiva successfully pursued new projects with Italian Foreign Assistance and the United Nations Environment Program (UNEP). This resulted in creating another ZEM, in Puerto Lopes, that has subsequently been sustained with grant funds from the Italian govern-

ZEMs to new activities was accompanied by a series of changes to the design of the loan program that have had major implications for how the program implements its activities along the coast. One decision was to require that the pre-selected partners (Box 4) responsible for implementing the major elements of the loan activities would negotiate new contracts each year. The original concept had been that the partners would operate through a single four-year contract. This has meant that the partners' activities cease, or are constrained, for several months each year as new contracts are negotiated and processed. A second change has been in the nature of the relationship between the Dirección Ejecutiva, the Fundación Maldonado, and the five ZEM offices. The Fundación, which played a central role in all ZEM-level activities during the planning phase, was selected during

the loan design to assume responsibility for the administration of the five ZEM offices. However, by the end of the first year of the implementation phase, all ZEM-level staff was being directly supervised by the technical specialists in the Dirección Ejecutiva. This is quite different from the process envisioned by the design in which ZEM-level staff would define their work priorities and formulate project-executing mechanisms with the local ZEM committee.

This change disempowered several of

the original ZEMs and compromised their potential as incubators for decentralized forms of coastal management. However, in 1999, following the mid-term evaluation a series of further adjustments to program procedures may re-establish a productive relationship with greater initiative at the local level.

#### Box 4.

##### Partners Selected for the Execution of Program Elements Supported by the IDB Loan

- Fundación Maldonado: Administration of the five ZEM offices
- CARE International: Execution of environmental sanitation projects
- The Polytechnic University of the Coast (ESPOL): Training and M.Sc. program in integrated coastal management
- The University of Rhode Island's Coastal Resources Center: Technical assistance

ment. The collaboration with UNEP was in the form of a planning grant to prepare a submission to design the La Segua wetland at the head of the Rio Chone estuary as a RAMSAR site. This second initiative did not proceed beyond the inventory and issue analysis stage. The redirection of the program's administrative staff from the original

**The Comisión Nacional.** During the grant support phase of the program, the Comisión Nacional held many of its regular meetings in the ZEMs. This allowed the commissioners to see first hand the issues that were being addressed. In several instances, the Commission endorsed local experiments in new forms of governance—such as the “stewardship contracts” by which groups of traditional users of mangroves assumed responsibility for the management of a specified area. The Commission worked to encourage interagency collaboration and formally approved the five ZEM plans that were completed in 1992. During the 1993-1996 transition period and the following years of program implementation, however, the Commission has been dormant. In this period, the principal function of the Commission is to approve, with minimal discussion, the annual work plans presented by the Executive Director.

**Working Groups.** During the planning phase, informal working groups were organized to address such topics as the need to reform the regulatory framework for mangrove management and identify critical areas of degraded coastal water quality. Working groups drew together knowledgeable individuals from government, academia and private sector. Each group had a long-term advisor selected for their international experience on the topic. The current IDB loan provides for continuing and amplifying this approach to the analysis of selected priority topics and framing options for policy-making initiatives to be considered and acted upon by the Comisión Nacional. Progress, however, has been limited to formulating a working group on mangroves in year three of the loan. Here again, political turmoil in Ecuador has made such activity difficult or impossible.

### *New Approaches to Governance Along the Coast*

In the mid-1980s at the start of the planning phase, the governance structure and process in the ZEMs was limited to the largely uncoordinated actions of agents of several central government agencies. Municipal government was present in small portions of only two ZEMs and the capacity of municipal government to contribute to progress on coastal management issues was universally viewed at the time as very limited. The ZEM-level design called for by the 1989 Executive Decree mandated that each ZEM have an Executive Committee composed of local-level governmental functionaries, including municipal officials (where these were present), that would be supported by an Advisory Committee. Advisory Committee members were appointed by the Office of the President in 1990. Appointments resulted from a public opinion survey to identify respected individuals in the private sector who would represent different user groups and private sector interests in each ZEM. However, many appointees showed little interest and the Advisory Committees gradually reconstituted themselves into a council of local leaders representing users groups drawn primarily from the poorer segments of society. Disinterest was also reflected among the local officials appointed to the Executive Committees and by 1992, all were inactive. The demise of the Executive Committees only further promoted the role of the Advisory Committees in filling the need for a public forum in which issues of concern to the community could be discussed and courses of action negotiated. Advisory Committee meetings became frequent events and many were attended by one hundred or more ZEM residents. The Advisory Committees

gained stature and demonstrated that they could organize needed services for the community. Governmental functionaries, including municipal officials, where these were present, attended the public meetings and, in some cases, became members of the Advisory Committees. The Advisory Committee meetings became the fora in which each element of the ZEM plans were debated and approved—the role originally envisioned for the Executive Committees.

During the three-year transition phase before the first disbursement of the IDB loan, the ZEM Committees continued to meet in the expectation that the release of the loan would provide the resources for implementing major elements of the ZEM plans. However, by the mid-term evaluation only a small fraction of the actions called for by the five ZEM plans had been completed. Performance has been well below the expectations detailed in the loan design. Nonetheless, in the more successful ZEMs, the ZEM Office and the ZEM Committee have sustained a close and productive working relationship with both the local municipalities and the local UCV. In other cases, there have been disagreements among port captains, the ZEM committees and municipal officials that have made forward progress difficult. Local politics, and the instability and modest capacity of newly created municipal governments have made it difficult to sustain a good relationship with successive municipal administrations representing opposing political parties.

**The Ranger Corps.** During the implementation phase, all seven UCVs became operational. While the patrolling activities and enforcement actions have increased dramatically, there has been little

action at higher levels (Track One) required to process and apply the penalties to offenders that are prescribed by law. Nonetheless, the UCVs have strong links with ZEM Committees and “community monitors” are helping to identify infractions, chiefly illegal mangrove cutting, as they occur. The shrimp farmers association of Guayas and Ecuador’s largest environmental group, Fundación Natura, are helping fund UCV patrols. Good results are being achieved by using conflict resolution techniques to negotiate conflicts over access to the shore and conflicts among shrimp farmers and traditional mangrove users. The destruction of mangroves, the primary concern of the UCVs, has slowed or ceased in the ZEMs but continues elsewhere along the coast.

## 6.

# *EXPERIMENTING with NEW APPROACHES to the PRIORITY MANAGEMENT ISSUES*

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**T**he PMRC is adaptive learning-based approach is organized around sets of strategies for each of the major coastal management issues. These strategies are listed in Box 5.

### *The Destruction of Mangrove Wetlands*

One of the most salient features of Ecuador's coast is its many estuaries with their associated mangrove wetlands. The goods and services that mangrove wetlands provide to society have been estimated by various methods in different parts of the world. One recent estimate, developed for Ecuador's Contraloria (El Comercio, 1999), places the per-hectare value of Ecuador's mangroves at \$13,000. The continuing degradation and destruction of Ecuador's mangroves, principally from the construction of shrimp farms, is widely viewed as one of the most important symbols of environmental degradation along the coast. It is also a powerful example of the inability of the governance system to significantly affect a very visible form of environmental degradation despite a long sequence of executive decrees, laws and regulations extending back over three decades. These regulatory pronouncements have reaffirmed in ever more stringent terms that mangroves must not be destroyed and they have increased the penalties for those who ignore the law. Their cumulative effect is to prohib-

it or severely constrain any form of human activity involving mangroves. Despite this increasingly complex legal framework, mangrove destruction continues (Figure 6).

In some estuaries, cutting has slowed because the best sites for shrimp ponds are occupied or there is little mangrove left. Within the ZEMs cutting has virtually ceased. Destruction is currently greatest in previously remote areas where "pirate" shrimp farm operations are a lucrative business. PMRC specialists estimate that the annual rate of mangrove destruction coastwide since 1995 is similar to the rate documented between the 1991 and 1995 surveys.

These data, generated by Ecuador's Military Cartographic Institute (CLIRSEN), define mangrove wetlands conservatively. They include areas covered by mangrove trees and do not include the associated mud banks and areas of open water. A more inclusive definition based on estimates of changes in the areas that could be defined as mangrove ecosystems would yield much larger figures for the losses. According to the CLIRSEN data, 26.5 percent of the mangroves that were present in 1969 had been destroyed by 1995. Within some estuaries the destruction is more than 80 percent.

## Box 5.

### PMRC Strategies for Addressing Priority Coastal Management Issues in Generation One

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#### **Degradation of Mangrove Ecosystems**

- Strategy 1: Increase public awareness of the benefits produced by mangrove ecosystems; document and analyze the implications of trends in their condition and use.
- Strategy 2: Develop and test mangrove management techniques that promote community-level stewardship and sustained use.
- Strategy 3: Improve awareness and enforcement of mangrove laws and regulations.
- Strategy 4: Work with the national agencies responsible for mangrove management to prepare a proposal for a new approach that emphasizes planning and sustained use at the community level.
- Strategy 5: Foster monitoring and research in support of management.
- 

#### **Sustained Artisanal Fisheries**

- Strategy 1: Assist selected artisanal fishing communities to develop and sustain the infrastructure and services required to produce quality products in a cost-effective manner.
- Strategy 2: Document the status and trends of selected fisheries known to be of critical importance to coastal livelihoods and under several pressures from human activities.
- 

#### **Sustainable Mariculture**

- Strategy 1: Prepare and promote a vision for a sustainable mariculture industry for Ecuador.
- Strategy 2: Bring international experience to bear in addressing priority mariculture issues.
- Strategy 3: Take actions at the local level to protect the environmental base of the mariculture industry.
- Strategy 4: Diversify the flow of benefits and species cultured.
- 

#### **Shorefront Development**

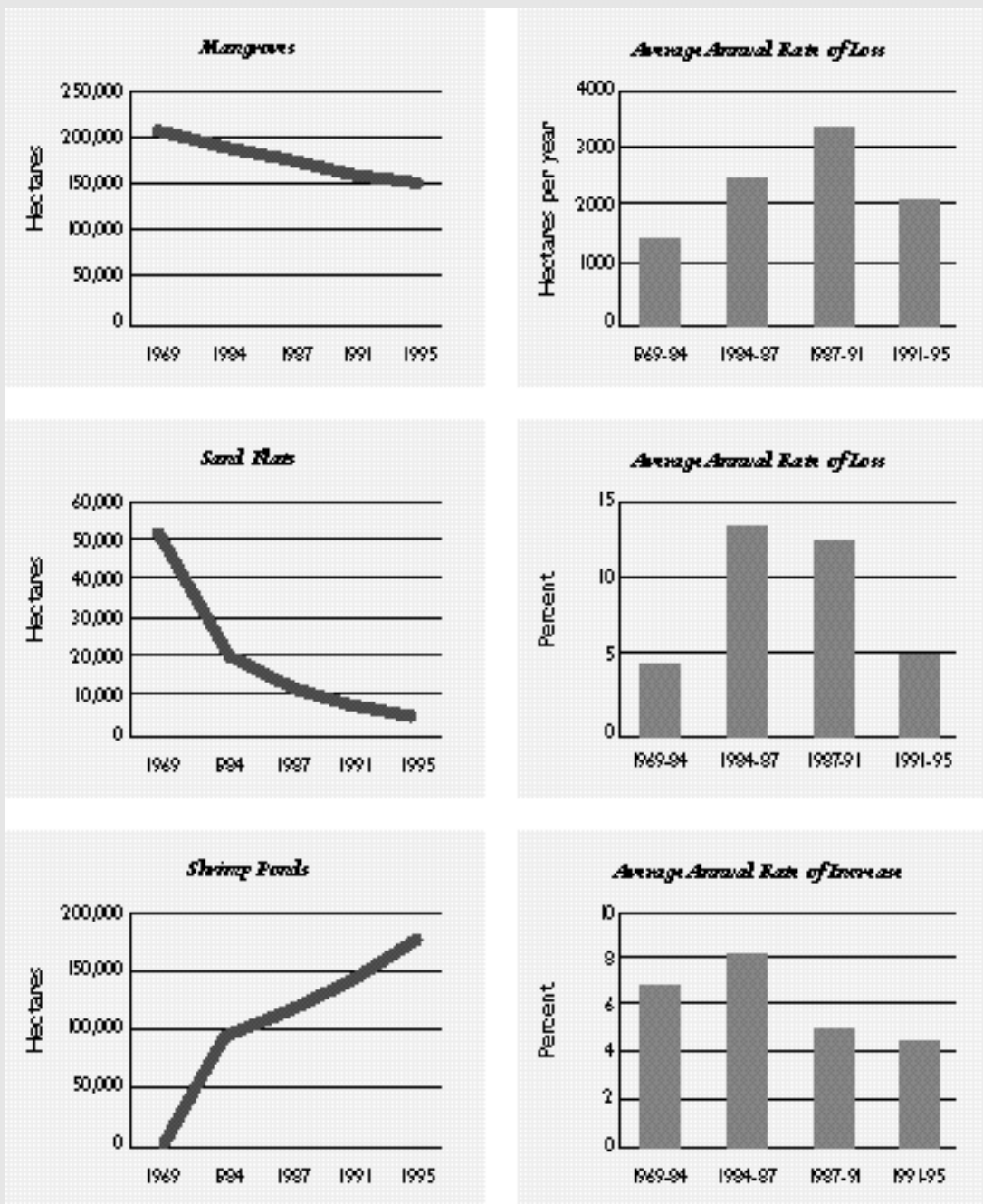
- Strategy 1: Map and analyze hazards and development issues posed by the use of the shore; promote good development practices.
- Strategy 2: Prepare and implement shore use plans and zoning in selected ZEMs.
- Strategy 3: Examine the economic and marketing potential of recreation and tourism development, especially in terms of its link to good environmental quality.
- 

#### **Environmental Sanitation**

- Strategy 1: Utilize investments in environmental sanitation as a means to mobilize small communities that are not qualified to receive funding for sanitation services from other sources.
- Strategy 2: Design and implement an intercalibrated water quality-sampling program focused on issues related to shrimp mariculture.

Figure 6.

Areas of Mangroves, Sand Flats and Shrimp Ponds, 1969-1995, as Revealed by Aerial Surveys Conducted by CLIRSEN (*the Military Cartographic Institute*).





An estimated 10 percent of the destruction of mangroves is attributed to the expansion of urban areas. The rest has been caused by the boom in shrimp mariculture. The current trend, however, is for shrimp ponds to be built in upland areas which are not within the public domain and have less impact on the mangrove wetlands that remain. The decline in mangroves has been exceeded by the decline in the sand flats that were a significant feature of Ecuador's estuaries and are believed to be important to ecosystem processes within estuaries. By 1995, 90 percent of the sand flats present in 1969 were gone.

**PMRC Strategies.** Beginning in the late 1980s, the PMRC began formulating alternatives to the regulatory approach to mangrove protection—alternatives that encourage sustainable human activities in the mangroves. One such strategy has been to make mangroves a central theme to all public awareness and school programs sponsored by the PMRC. These public outreach and educational initiatives have been sustained for over a decade. They have involved thousands of school-children; have included numerous public events and TV spots; and as a result have kept mangrove conservation in a prominent place on the public agenda. In recent years, shrimp farmers' organizations have made public pronouncements expressing their commitment to mangrove conservation.

A second PMRC strategy is to apprehend those who destroy mangroves. This is the top priority for the UCVs. Their joint patrols and coordinated enforcement actions have increased sharply and totaled over 200 enforcement actions in 1998 alone. The somewhat lower annual rate of mangrove destruction since 1991 coincides with the

organization and patrolling program of the UCVs. Nonetheless, mangrove destruction continues at an unacceptably high rate and a very small percent of the enforcement actions are resulting in sentences. Sentencing requires action by the judiciary and when important personages are involved, often draws in the actions of well placed allies of the offender.

The PMRC's most notable success lies in developing management techniques that promote stewardship and sustained use practices among traditional mangrove users and coastal communities.

Beginning in 1996, the PMRC has conducted successful pilot projects that assign designated mangrove areas to associations of shellfishers. The associations have replanted mangroves, re-established water circulation in abandoned shrimp farms, and modified their fishing practices to protect undersized shellfish and brood stocks that can help restore overfished populations. These demonstrations have produced promising results but are yet to be widely replicated. Other demonstrations have resulted in replanting 700 hectares of mangroves. A third set of demonstration projects has funded ecotourism initiatives, including building information centers and elevated trails in mangroves as. These facilities are managed by local youth groups.

### *The Decline of Nearshore Fisheries*

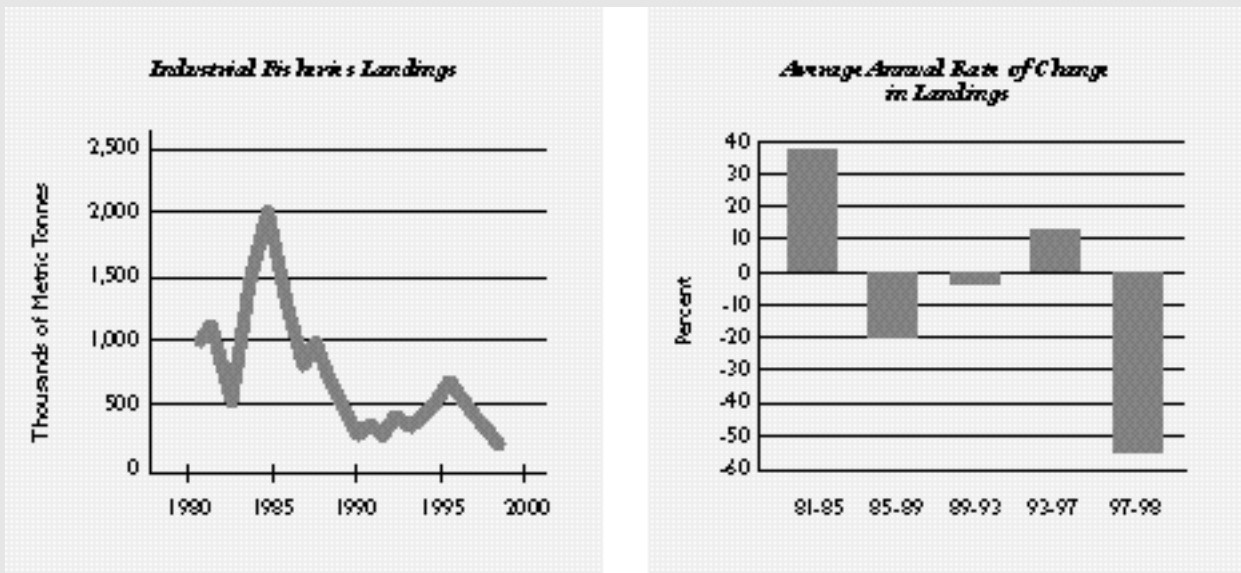
Fisheries are an important source of food, income and employment, all along the coast. Artisanal fishers include many of the poorest of the poor. Ecuador's marine fisheries can be divided into two large categories. The industrial fishery is conducted by vessels that operate from the shore to distant

grounds and the bulk of its catches are exported. This fleet, particularly the shrimp trawlers, is over-capitalized and inefficient. Data on long-term trends in the effort and catches of the far more numerous artisanal fishers are either nonexistent or of very poor quality. This situation is typical of fisheries throughout the tropics. Ecuador's official harvest estimates for industrial fisheries suggest that catches peaked in 1985 and have subsequently

nearshore fish and shellfish upon which artisanal fishers depend have declined drastically over the past 40 years. For example, mangrove crabs and mangrove cockles were abundant, inexpensive, and a popular food among poor coastal people until the mid 1980s. Today, harvest rates are a quarter of what they were and these shellfish are no longer a feature of the diet of poor people. Catches of finfish, particularly estuarine-depen-

Figure 7.

Landings from Industrial Fisheries, 1981-1998



Source: Direccion General de Pesca

declined. The decline is due to the combined effects of overfishing and habitat destruction. The decline in catches from both sectors are masked by periodic El Niño effects during which warm ocean currents and heavy rainfall cause many fish populations to collapse while the *P. vannamei*, a white shrimp that is well adapted to these conditions, simultaneously become very abundant. It is nonetheless all too clear that the estuarine and

dent species, have seen similar declines. There have been examples of migrations of entire fishing communities from such places as the Rio Chone estuary to other, less degraded, areas of the coast. The shrimp-farming boom has given rise to a fishery for the barely visible post-larval shrimp that are used to stock the shrimp ponds. In times of abundance, this fishery provides occasional employment for several thousand people, includ-

ing displaced agricultural workers that have migrated to the coast from degraded agricultural lands in the highlands.

**PMRC Strategies.** Each of the ZEM plans contains a section on artisanal fisheries and identifies a series of actions that would improve onshore facilities in support of artisanal fishing activities and measures that would assist the well-being of this very poor segment of society. The IDB loan has enabled some of these actions to be implemented. A separate program funded by the European Union has adopted the approach to fisheries detailed in the ZEM plans and has implemented a program that encompasses the construction of fisheries facilities, training programs in engine repair and small business administration and the compilation of catch statistics. Reflecting the philosophy of the ZEM plans, capacity building and infrastructure address not only the needs to provide landing facilities and gather better catch data, but also the needs of fisher families for health services and diversification of family income. This program demonstrates the high potential for leveraging other sources of funds to advance the PMRC philosophy and objectives.

A successful feature of the loan-funded program is a partnership between the PMRC and the National Fisheries Institute. This has provided funds for documenting baseline conditions in two “critical artisanal fisheries” that support a large proportion of the artisanal fishing community and whose sustained success is essential to the farmed shrimp industry. The first of these fisheries is that for shrimp postlarvae. These postlarvae are harvested with fine-meshed push nets by thousands of people working in the surf zone during periods of abun-

dance associated with the full moon. These wild-caught shrimp provide shrimp farmers with an abundant source of vigorous seed shrimp at a lower price than those produced by hatcheries. The second “critical” fishery is for adult egg-bearing female shrimp upon which many shrimp hatcheries depend and that supply seed shrimp to the farms when wild postlarvae are scarce. Both fisheries are virtually unregulated and in both cases well-informed observers are convinced that the trends in catches are downward. Indeed, in other regions of the world, similarly targeted fisheries have led to a collapse in wild shrimp stock abundance. Recognizing this trend, researchers from the National Fisheries Institute have added an extension component to their work and are collaborating closely with fishers to gather catch data and identify options for conserving the resource. The team working on the postlarvae fishery has developed a new push net that is less damaging to the shrimp and reduces the by-catch of larval and juvenile shellfish and finfish—another major concern. The potential for disseminating the new net appears to be high.

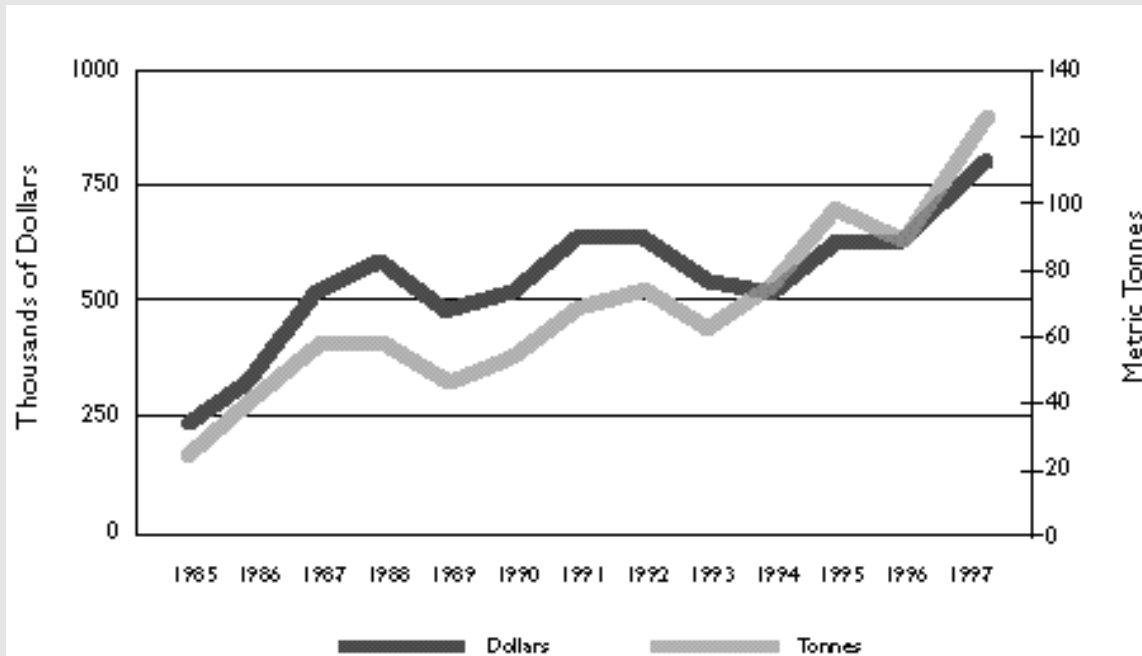
### *Opportunities for Sustainable Mariculture*

Shrimp mariculture capitalizes on the high productivity of coastal ecosystems by privatizing areas with estuarine conditions. By controlling the flow of water in and out of large ponds, mariculturists create an enclosed estuarine environment in which juvenile shrimp can be raised to a harvestable size. Shrimp farming began in Ecuador in the late 1960s and quickly developed into a major economic boom. In the 1970s and 1980s, shrimp farms were built primarily in publicly owned intertidal mangrove wetlands and sand flats. A large proportion were built illegally without permits but were recog-

Figure 8.

### Volume and Value of Shrimp Exports

*These data include contributions from the trawler fleet.*



Source: Banco Central de Ecuador

nized in the mid-1980s through a series of amnesties. Today, Ecuador is one of the world's largest producers of farmed shrimp. Although shrimp farming provides some jobs to local people, both production rates per hectare and employment are low compared to similar operations in Asia. The industry has displaced traditional users of estuaries and mangroves and has contributed to, and suffered from, the steady decline of water quality in many estuaries. Despite these difficulties, the culture of shrimp and other species—including those suitable for local markets—continues to hold great promise. Ecuador's coast is well suited to mariculture and a diversified and stable industry could provide high protein food for local people, employment and high value exports.

**PMRC Strategies.** Ecuador's highly successful shrimp mariculture industry is a textbook example of the need for integrated approaches to coastal management. While the industry has repeatedly demonstrated that it can respond quickly and effectively to threats that it can address internally, it must rely upon a larger coordinated effort if conflicts with competing coastal activities and declines in ecosystem qualities are to be addressed successfully. In 1986, in its first year of operation, the PMRC sponsored an international symposium to bring worldwide experience to bear on defining an agenda for a sustainable shrimp industry in Ecuador. The symposium successfully identified the issues that have subsequently emerged as most critical to sustained success. These include measures

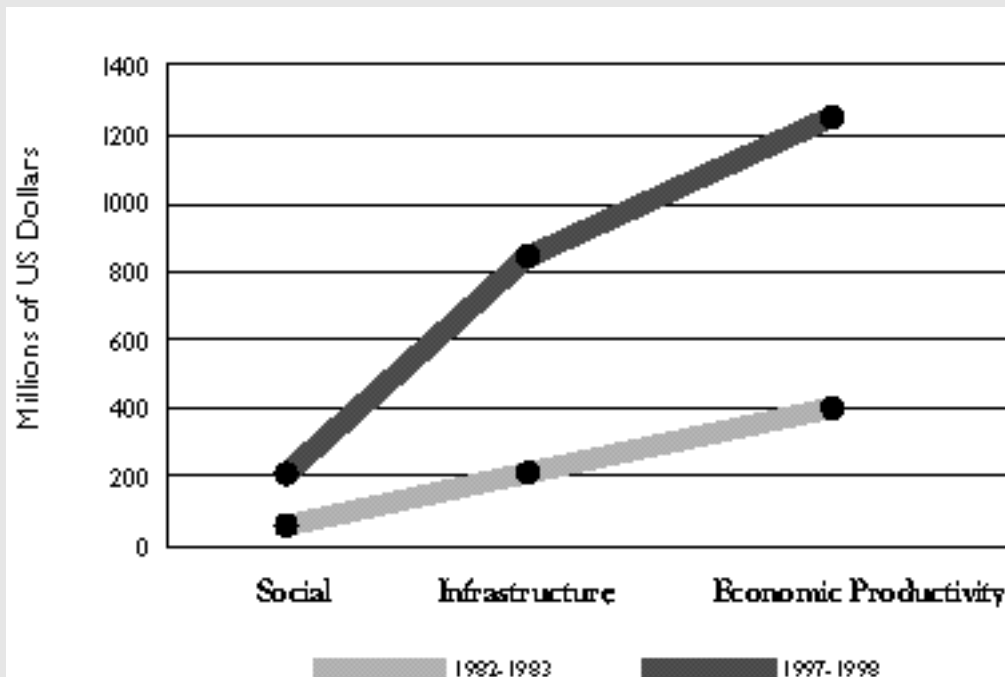
that protect estuarine water quality, sustain the stocks of wild shrimp upon which the industry depends for its seed supply, and measures that control the over-building of ponds in individual estuaries. Initially the industry was suspicious of any form of “governmental interference” in its operations. By the mid-1990s, the attitude was very different. The change had been brought by a sequence of disease epidemics that drastically reduced production and profits in shrimp farming operations and took the industry by surprise. These problems are related primarily to declines in the quality of the water that is pumped into the production pond. Estuarine water quality is being reduced by the increases in nutrients flowing from both the shrimp farms themselves and from an increasingly urbanized coastline. Other impacts may be related

to the use of agrochemicals near to shrimp farms and to alterations to the inflow of fresh water resulting from the construction of dams. Many leaders in the industry now recognize that the PMRC’s concern for water quality, mangrove conservation, more effective management of wild shrimp stocks, and a planned approach to the continuing development of the shoreline, are all in the long-term interest of the industry.

It is proving more difficult to attract support for a more diversified mariculture industry designed to improve the well being of the poorer segments of coastal society. Although public health data show a disturbing decline in the protein intake of the population, and a high incidence of malnutrition in schoolchildren, the potential for forms of

Figure 9.

Estimated Damages from the 1982-83 and 1997-98 El Niños.



Source: UECEP, 1998

mariculture designed to serve domestic markets is yet to be recognized.

### *Shorefront Development*

The 1,256-kilometer continental coast is blessed with stretches of sandy beaches, magnificent vistas and features of great historical and ecological significance. These assets, when combined with an expanding highway network, are the basis for the most recent development boom—in international tourism and shorefront urban developments. This incipient construction boom adds to the pressures brought by a resident population in the coastal provinces that has increased fourfold since 1950. Shorefront development is often poorly planned and inadequately regulated. As a result, costly structures—including hotels, port facilities, seawalls and roads—are sited inappropriately. Scenic qualities are being needlessly compromised, and public access to the shore is being reduced and in some cases eliminated. The most dramatic economic and environmental consequences of inappropriate shorefront development are seen during severe El Niño years when prolonged rainfall and stormy seas produce flooding, landslides and coastal erosion. Global climate change is increasing the frequency and the intensity of such events. In the most recent 1997-98 El Niño, damages to public infrastructure and private property along the coast were estimated as in excess of \$2 billion.

**PMRC Strategies.** The ZEM plans contain recommendations for construction setbacks and the location of shorefront infrastructure that is based on a detailed analysis of coastal erosion and accretion processes along the entire mainland coast. These findings and the identification of hazardous

areas where construction should be prohibited or constrained are contained in an atlas published in 1994. It has, however, proved difficult to implement the shorefront management elements of the program. The problems lie in the need for consistently applied regulations—a form of management that so far has eluded the majority of the municipalities that possess the requisite authority. Nonetheless, there have been some instructive successes. For example, the Estero Huyla, within the rapidly growing city of Machala, that developed as a shantytown “invasion” has been rehabilitated. In addition, a sequence of clean-up campaigns has produced an aware citizenry that has upgraded its neighborhood and now implements improved waste disposal practices. Similarly, the PMRC has organized and worked successfully with beachfront vendors and small businesses in the resort town of Atacamas. The results are many and include a lifeguard program, beach cleaning, planting of vegetation and controlling the intrusion of structures onto the bathing beach. These case studies reaffirm the importance of consolidating First Order Outcomes before significant progress can be made on changing undesirable forms of behavior. In these cases, the PMRC has placed a great emphasis on organizing user groups into formally constituted associations with which the PMRC can then work to negotiate conflicts and formulate a common vision for a shorefront development process that will benefit the majority. Such grassroots organizing has led to the negotiation of detailed plans for serving the appearance of tens of thousands of holiday makers on the weekends associated with Holy Week and Carnaval.

## *Declining Coastal Water Quality and Environmental Sanitation*

The coastal region's rapidly growing population creates mounting demands for the services and infrastructure required to provide an adequate supply of potable water, adequate sewage collection and disposal and solid waste disposal. Major investments in such services were made in the 1980s and continue today. Nonetheless, poor environmental sanitation combined with few controls over the discharge of industrial wastes and the widespread use of agrochemicals are all contributing to declining coastal water quality. As yet, water quality degradation sufficient to cause a health hazard and affect productivity of shrimp farms is limited to some estuaries and intensely used beaches along the ocean coast. However, the incidence of hepatitis and other waterborne diseases is high and Ecuador confronted a cholera epidemic in 1991-92. Areas of the Guayas estuary, where shrimp ponds are most abundant, began suffering in the early 1990s from a series of poorly understood water quality-related problems that caused many shrimp farms to discontinue their operations or survive at greatly reduced production rates. Perhaps the one benefit of the most recent El Niño is that it thoroughly flushed Ecuador's estuaries and removed many of the accumulated pollutants. Trends in water quality in estuaries have not been monitored in recent years.

**PMRC Strategies.** During the grant-supported phase of the program, the PMRC's Working Group on Water Quality demonstrated the potential of a collaborative approach to the analysis of issues and formulation of an action agenda on this important coast-wide issue. This Working Group successfully organized the intercalibration and upgrading of the many laboratories engaged in water analysis. Targeted sampling identified the specific areas where water quality threatens public health and the productivity of both shrimp ponds and estuaries.

Water quality sampling was linked to environmental sanitation efforts that included improved sewage treatment, solid waste disposal and collection, and beach cleanups in low-income shorefront communities. Since environmental sanitation technologies are well known and sanitation problems are a top priority for ZEM residents, a major portion of the resources allocated for ZEM plan implementation were directed at the construction of latrines, sewers, and solid waste collection. CARE International was selected to implement this portion of the program. There have been many delays in implementing these activities and they were all scaled back considerably by the time of the mid-term evaluation. The PMRC has subsequently reconfirmed that the funding of sanitary services is best provided by other institutions. The PMRC's niche should be to provide specialized technical assistance to municipalities and communities on the siting of wastewater discharge pipes, the control of sedimentation, and other issues that relate directly to the quality of coastal waters.

# 7.

## EMERGING LESSONS

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Ecuador's coastal management program has evolved and prospered during times of great social, political and economic change and instability that has been compounded by a series of environmental crises. Despite these growing pressures, the program has made substantial progress in achieving both First and Second Order Outcomes. These are summarized in Boxes 6 and 7.

A number of lessons are emerging from the IDB-supported phase of the program:

***A.) Instability in leadership and changes to the program design have taken their toll during the program implementation phase.***

During the initial three years, there have been frequent changes in the Executive Director and deviations from the design of the program. For example, the decision to renegotiate each year the contracts with the pre-selected partners that are responsible for the execution of important components of the program have caused delays of four to 11 months in their activities each year. Despite such difficulties, the program has shown remarkable resilience during a period of great political and social turmoil. The strategy to vest the program in the Office of the President and to proceed simultaneously on "the two tracks" has maintained the program as a priority initiative for Ecuador. A second-generation program should, however, consider making adjustments to the institutional design so that it can function with greater internal stability and efficiency.

***B.) The ZEM plans are an important reference point for management at the community level.***

Much effort was invested between 1990 and 1993 in the negotiation of the policies and priority actions that are contained in the five ZEM plans, their formal approval by the Comisión Nacional and their subsequent incorporation into the National Development Plan. The ZEM plans continue to provide the framework for the activities supported through the IDB loan each year. They are also important to the success of individual ZEM committees in negotiating successfully for additional funds from the Italian and Swiss foreign assistance programs, from USAID, and from the United Nations Small Projects Fund. The reviews of the plans that have occurred in some ZEMs have reconfirmed the relevance of the policies but demonstrate the need to update the actions required to implement them effectively. This updating process will be important if the ZEM plans are to continue to serve as a reference point for coastal management at the local level.

***C.) The ZEM committees have emerged as a governance mechanism that can complement municipal government and the activities of the UCVs.*** The ZEM committees, as a council of organized user groups, have demonstrated on various occasions their ability to negotiate a coastal development and conservation agenda at the community level. They have been able to integrate and prioritize the management initiatives of both user groups and formal authorities in the form of annual work



## Box 6.

### Summary First Order Outcome in Generation One

*Formally constituted coastal management institutions and constituencies that actively support coastal management initiatives*

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#### **Track One:** *Management at the National Level*

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##### **Governance Structure**

- Executive Decree 375 (1989) and 3399 (1992) formally established the PMRC and detailed its functions
- Lead Agency: Office of the President; Directorate of Public Administration
- National Commission for Coastal Resources Management created in 1989
- PMRC Executive Directorate staffed, trained and equipped, based in Guayaquil
- Working Groups on mangrove management and water quality active 1989-1993

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##### **Constituencies**

- Constituencies for the PMRC identified as signatories to 1988 Manifesto in Support of a PMRC; five presidents have supported the PMRC; the National Commission can serve as a high-level forum supportive of the program
- The PMRC's approach to management, with its emphasis upon sectoral integration and the social implications of change, is being widely adopted within both public (e.g., INP, the Navy's DIGMER) and private sectors (ESPOL, the Aquaculture Association of Guayas)

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#### **Track Two: Management by Coastal Communities/Institutions**

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##### **Governance Structure**

- ZEM Committees provide a needed vehicle for awareness building and community action on PMRC issues; they have demonstrated their effectiveness in El Niño-related crises
- Detailed ZEM plans prepared through participatory processes and approved by National Commission
- UCVs conduct joint patrols and collaborate in enforcing regulations over coastal resource use and monitoring coastal change

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##### **Constituencies**

- Mayors of established and newly created municipalities support the PMRC; some find ZEM committees to be important partners in resolving coastal governance issues
- Hundreds of user groups have been organized and trained; they actively contribute to coastal management initiatives in the ZEMs
- Fundación Natura and other NGOs are actively supporting the PMRC and ZEMs
- A growing diversity of international donors are supporting the ZEM Committees with funds and technical assistance

## Box 7.

### Summary Second Order Outcomes In Generation One

*Correction or mitigation of behaviors that reduce coastal qualities;  
selected development and conservation actions taken*

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#### Outcomes at the Regional Scale

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##### Mangroves

- Some reduction in annual rate of mangrove loss
- Sharp increase in patrols, enforcement actions
- Census of mangroves, sand flats and shrimp ponds approximately every five years
- Executive Decree 410 creates Committee for Interinstitutional Coordination to Protect and Conserve Mangroves
- Vigorous public awareness, school education programs on coastal issues

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##### Artisanal Fisheries

- Baselines documented by INP for shrimp postlarvae and gravid female fisheries
- Improved data collection on artisanal fisheries
- New INP postlarvae net tested, dissemination underway

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##### Mariculture

- Shrimp farmers associations support UCV patrols and PMRC strategies to promote sustainable mariculture
- Linked mathematical models of shrimp ponds-estuary conditions developed using Rio Chone data

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##### Shorefront Development

- Coastal atlas identifies hazardous areas, provides basis for construction setback lines
- “Macro zoning” and urban waterfront redevelopment plans underway

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##### Environmental Sanitation

- Intercalibration of water quality laboratories
- Water quality “hot spots” identified

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#### Outcomes at the Community Scale

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##### Mangroves

- Mangrove loss halted or very limited within all ZEMs
- 700 hectares of mangroves replanted
- Successful demonstrations of mangrove stewardship contracts with traditional user groups

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##### Artisanal Fisheries

- VECEP and PMRC have funded infrastructure improvements and organized services in several communities

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##### Mariculture

- Successful demonstrations of techniques for enhanced mangrove cockle production

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##### Shorefront Development

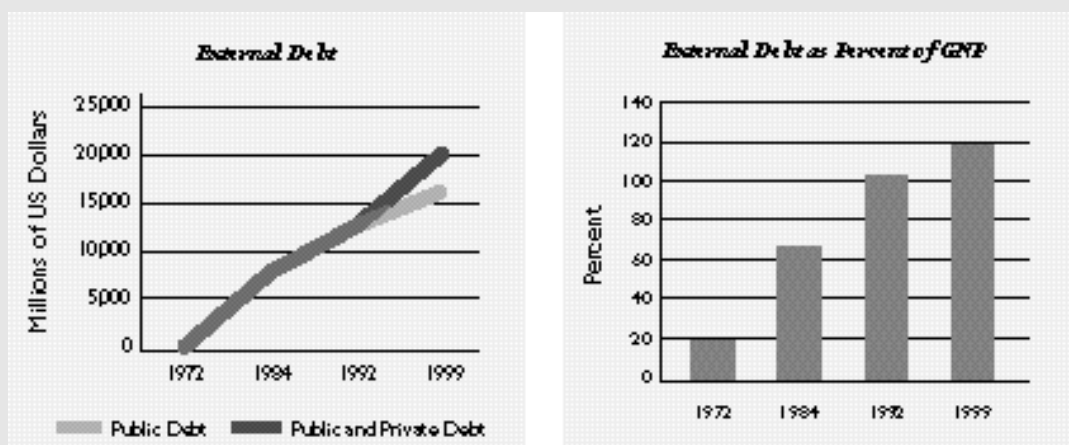
- Demonstration of rehabilitation, improved management of waterfront barrios
- Shorefront management commissions active in three ZEMs

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##### Environmental Sanitation

- Beach clean-ups conducted periodically by volunteer groups
- Latrines built with contributions of beneficiaries
- Solid waste collection services organized and sustained
- Potable water supply systems upgraded or constructed

Figure 10.  
Ecuador's External Debt Compared to its GNP



Source: Banco Central de Ecuador

plans. In times of crisis, as for example, during the floods brought by the recent El Niño, in several instances the ZEM committees demonstrated their effectiveness as grass-roots decisionmaking and coordinating bodies. Several ZEM committees are demonstrating that they are capable of administering activities funded by a diversity of donors.

**D.) The program is at a critical point of articulation.** As summarized in Boxes 6 and 7, there has been notable progress in the creation of governance institutions in constituencies and in the demonstration of new management practices that address the major management issues. It is essential that these advances receive continued support if their potential benefits are to be harvested. For example, the formation of the UCVs, their joint patrols and sanctioning of those who break the law must be supported by the courts and by the important initiatives of the Ministry of the Environment. If penalties are not applied, the impacts of the UCVs on those who continue to destroy mangrove wetlands will be negligible. Another priority is to replicate such new management practices as stewardship agreements for the

use of designated areas of mangrove for their restoration and as a source of sustainable activities. The successes in collaborative actions by the ZEM committees, municipal authorities and UCVs must be analyzed, disseminated and replicated.

**E.) The PMRC's experimental and participatory approach to coastal management remains the program's greatest strength.** An overtly experimental approach to coastal management is appropriate in a situation where resource management issues are complex and traditional sector-by-sector, top-down approaches have historically produced meager results. The program's "rolling design" calls for selecting annual activities after a self-assessment of the previous year's experience and formulation of a work plan based on the accumulating experience from "management experiments" in pilot sites. These procedures have at times not been fully implemented in recent years. Yet the experimental approach, when it is applied, continues to produce valuable experience and new management practices with a high potential for replication. Examples include stewardship agreements for areas of man-

grove, demonstrating artisanal mariculture technologies, developing a new, less-damaging net for postlarvae fishers and applying conflict resolution techniques to the enforcement problems addressed by the UCVs. On the other hand, the annual recontracting process for the pre-selected program partners has heightened uncertainty and produced long periods of inaction.

**F.) Initiatives that outstrip the capacity of the implementing institution tend to fail.** The IDB precondition to loan disbursement that required new mechanisms and new criteria for the renewal of shrimp pond concessions damaged the program. It placed the PMRC in the position of attempting to negotiate a change to established regulatory procedures over which it had no control. The result was almost a three-year paralysis in ZEM-level activities, the hostility of PMRC partner institutions with permit granting authority, and suspicion within the farmed shrimp industry. The compromise “solution” that released loan funds has produced no significant change in shrimp farm concession procedures. Another mismatch between objectives and institutional capacity is seen in the expectations for a management initiative addressing an estuary and its watershed. This is the proposed Rio Chone estuary management initiative that has thus far proved beyond the reach of the local research and civil institutions that should be involved in an area that was convulsed by a series of natural disasters brought by a severe El Niño followed by an earthquake. A third example are the newly created municipal governments some of which have until now been unable to engage in meaningful shore-front planning and regulation. While consulting companies and external experts can in all instances complete the requisite technical tasks, they are

unlikely to produce the sustained change in governance processes that lie at the heart of both such problems and their solution.

**G.) Decentralization requires power sharing.** Since its inception, the PMRC has been based on the principle that effective coastal management requires collaborative action by several governmental ministries and application of the subsidiarity principle. Both require power sharing and a system of checks and balances that can safeguard the program from the dominance of any single interest group or institution. The tendency during the initial implementation phase has been to concentrate power in the Dirección Ejecutiva and to minimize initiative and responsibility within the ZEMs and the partners pre-selected by the design to implement elements of the program. This tendency has reduced the capacity of the program to achieve its long-term objectives and compromises its identity as a promising initiative in decentralized governance.

**H.) In those cases where elements of the PMRC’s agenda have been successfully implemented through existing coastal institutions, these activities have built capacity and institutionalized new approaches to resource management.** The National Fisheries Institute, ESPOL—the polytechnical university of the coast—and the institutions participating in the UCVs have added new dimensions to their programs and their involvement has done much to disseminate issue-based approaches to complex resource management issues that recognize the social-justice dimensions posed by coastal change.

#### Box 8.

#### The Subsidiarity Principle

Decisions should be made at the lowest level of society as is practical and consistent with the public good. This requires the allocation of power among several levels of authority.

# 8.

## THE PATH AHEAD

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The process of social and environmental change is accelerating along the coasts of Ecuador. New challenges and new opportunities are continually appearing. The implementation phase of a first generation of management in Ecuador will end in 2001, bringing the cycle of a first generation of coastal management to a close. The process of reflecting on the lessons that have been learned thus far and reassessing the issues that confront the program and the coast began with the mid-term evaluation of the IDB loan in early 1999.

Those involved in the program believe that the principles that have guided the program over the past many years will serve it well on into the future. This requires strengthening mechanisms that will enable the PMRC to foster an approach that formulates management strategies place-by-place and tailors them to the local management capacity and local priorities. In a second-generation program, however, a larger proportion of the program's activities should be outside the current ZEMs and should involve municipal governments directly.

**Bridging Activities.** During the remaining two years of the current IDB loan, two activities emerge as essential to a bridge between a first and second-generation program. The first is to analyze the differences in community level governance within the ZEMs and the impacts of such local governance on the issues upon which the PMRC has

focused in its first generation program. These are the First and Second Order Outcomes shown in Figure 3. As of this report, it is known that there are substantial differences in the relative success of ZEMs but the nature of the differences and why they exist are yet to be examined and documented. The analysis should also assess the evidence of impacts in communities served by the VECEP project since it adopted the approach detailed in the 1992 ZEM plans. Comparisons should be drawn with selected communities where there have been no known interventions. In the absence of such an analysis, the impacts of the program and the practices that are deserving of replication will not be identified. As successful practices are identified, they should be replicated and thereby strengthen the program's activities at the community level in the remaining period when IDB funds are available.

The second priority is a response to the construction boom in "high end" residential compounds and tourism facilities that is now underway along stretches of previously undeveloped coastline. Beginning in late 1999, the PMRC will launch activities designed to articulate a "vision" for the future development of the continental coast that will provide a framework to guide future change. One set of activities will result in plans for the revitalization and multiple use of selected urban waterfronts. The second, termed "macrozoning," will review the existing and projected patterns of development along the continental coast and identify:

- Areas of particular concern for development, including sites where conflicts among user groups exist or are likely to emerge, or areas where natural hazards pose development limitations; areas that should be reserved for coastal-dependent activities; and areas where public access to the shore must be safeguarded
- Areas designated for preservation and restoration
- Construction setbacks for major public and private infrastructure

*Features of a Second Generation Program:  
Track One*

The analysis and lesson drawing that has occurred thus far suggests that some adjustments to the program should be considered as the detailed design of a second generation program begins. The following ideas have emerged from a series of discussions with participants and observers of the program in Ecuador.

**The Dirección Administrativa.** Those charged with planning a second generation effort should identify and assess options for adjustments to the institutional design that could bring greater stability to the Dirección Ejecutiva and more consistent leadership loyal to the principles upon which the PMRC has been constructed.

Rather than focusing their energies on the execution of Track Two activities, the small staff or technical specialists in the Dirección Ejecutiva should work as a team to:

- Award and evaluate two funds (see below) as the program's primary means for good coastal management practices at the local level

- Design and implement an environmental and societal monitoring scheme designed to track trends in changes in the quality of coastal ecosystems and well-being of coastal society
- Assemble working groups on important coastal issues; bring forward policy options and emerging Track Two experience for discussion and coordinated action by the Comisión Nacional
- Continue its excellent public education and school programs with an emphasis on disseminating the implications of trends in coastal change and the good practices that are emerging from resource management initiatives

The inefficiencies experienced during the loan-funded phase could be overcome if Track Two activities were administered as two funds.

*Fund A: Community-level Coastal Management.*

Coastal municipalities, ZEM committees, NGOs and other private sector groups should be invited to apply for funds to carry out specified types of activities including:

- The replication of management practices and technologies tested during Generation One
- Implement shorefront management schemes that are consistent with the "macrozoning" plan to be completed in 2000
- Shorefront and estuary restoration projects including re-use of abandoned shrimp farms
- Community and user group management of mangroves
- Updating the ZEM plans approved in 1993

This fund should operate through an annual funding cycle with reauthorization dependent upon project performance.

*Fund B: Coastal-dependent Micro-businesses.*

The second fund supervised by the Dirección Ejecutiva would create a micro-business and loan program directed at those elements of the coastal poor whose livelihoods are dependent upon such coastal resources as nearshore and estuarine fisheries, mangroves, coastal tourism and the like. The PMRC should partner with an experienced Ecuadorian NGO with demonstrated capabilities that would provide the necessary analysis and technical backup to micro-businesses, and micro-loans designed to diversify livelihoods among the poor and promote sustainable forms of coastal resource use. This would enable the program to more efficiently build upon experience gained in first generation projects while placing a greater emphasis on the replication of successes.

**The Comisión Nacional.** The Comisión should be reactivated as an interministerial coordinating body and as a forum for discussion and policy setting on coastal topics of national significance. These roles and the use of interinstitutional, private-public working groups as a vehicle for formulating policy-relevant options for the Comisión's consideration have been dormant since 1993. This should not be interpreted as meaning that they are no longer viable as a means for improving coastal governance at the national level.

*Features of a Second Generation Program:  
Track Two*

The two funds recommended above would maintain the PMRC's fundamentally experimental, incentive-based approach to integrating improved resource management along the continental coast. It will be

important to revise and expand the Reglamento Operativo so as to articulate the criteria for project selection and provide for streamlined procedures for the disbursement of funds.

**Enhanced Communications and Exchange.**

In recent years, there has been little communication among the municipalities within ZEM boundaries. ZEM-level staff and ZEM committees working to improve how the coast is managed should meet to pool their experience and discuss collaborative action. The PMRC should encourage and promote such exchange through an annual workshop and a small fund to promote reciprocal visits among ZEM, municipal and NGO participants.

**Extension Program.** An Extension program and carefully targeted applied research are clearly needed to provide technical backup to a great diversity of coastal resource users along the coast. In the last several years, both ESPOL and the National Fisheries Institute have developed capabilities in these areas. ESPOL is successfully offering an M.Sc. in coastal management and continues to attract participants from throughout Latin America to its two-week training course. The PMRC should actively encourage these expressions of an expanding capacity and commitment to coastal management practice.

**UCVs.** The UCVs have emerged as another successful and innovative element of the PMRC. They should continue as an integral element of a second-generation program. In the future, special attention should be given to simplified procedures for joint enforcement actions and to greater emphasis on conflict resolution techniques. The UCVs also have an important role to play in monitoring coastal change and its impacts upon different coastal user groups.

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