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The four major goals of the International Coastal Resources Management Project (CRMP) are to: 1) apply, as appropriate, existing experience in coastal resources management to developing countries; 2) assist three developing nations in the design and implementation of integrated coastal resources management programs; 3) advance the state-of-the-art of coastal resources management in developing countries; and 4) build The University of Rhode Island's capability to assist developing nations with coastal resources management.

The CRMP will work with the cooperating pilot countries to:

- develop procedures for the assessment of the impacts of coastal development proposals
- develop institutional and technical solutions for resource use conflicts
- support research to better understand the issues that affect the condition and use of coastal ecosystems
- improve the capabilities of in-country professional staff to plan for and manage coastal development

The countries selected for pilot projects are Ecuador, Sri Lanka, and Thailand.

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STRUCTURE AND OBJECTIVES
OF A COASTAL RESOURCES
MANAGEMENT PROGRAM
FOR ECUADOR

and

A MANIFESTO IN
SUPPORT OF THE PROGRAM

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The final version received input from local authorities, experts and representatives of the private sector, during special workshops held in the coastal provinces. The workshops also resulted in the selection of the Special Management Zones and the identification of the major conflicts and problems along the coast.

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I. THE IMPORTANCE OF ECUADOR'S COASTAL ECOSYSTEMS

Ecuador's coastal region, when defined to include the provinces that encompass the lowlands between the ocean and the Andes, has emerged as the stronghold of progress and development for the country. Ecuador's future economic development in large measure depends upon how its coastal ecosystems are utilized and managed.

The recent boom in shrimp mariculture along the coast has made this the largest private sector activity in the country, second only to petroleum in the value of goods exported. The estuaries provide critical habitat for fish and shellfish populations that support more than one hundred thousand artisanal fishermen who produce a critically important source of protein for the region's rapidly growing population. Ecuador's coastal ecosystems contain the nation's best farmland and produce virtually all of the nation's agricultural exports. The condition of Ecuador's coastal ecosystems is today more important than ever since the population in these lowland provinces has more than doubled since 1950. The growth is most rapid in coastal cities where birth rates are the highest in the nation. Guayaquil, the nation's largest and most quickly growing city, is the center for banking, industry and a thriving sea port.

It is of the utmost importance that the resource base that could indefinitely produce a rich bounty of agricultural products, lumber, fisheries and cultured seafood is not needlessly degraded and loses its ability to produce the goods and benefits that are of central importance to Ecuador's economy and political stability.

Today, both the opportunities and problems posed by how the coast is managed has reached a critical juncture. Once luxuriant coastal forests that supported a booming shipbuilding and lumber export trade a century ago have virtually all been replaced by low yielding, frequently eroding, pastures. The construction of over 120,000 hectares of shrimp ponds has brought the almost complete eradication of mangroves in many estuaries. The industry continues to threaten this critically important habitat that, among many other benefits, is of vital importance to sustaining the wild shrimp populations that produce the seed with which the mariculture ponds are stocked. Similarly, declining water quality is a threat to both public health and the ability of estuarine habitats to support fisheries and the mariculturists who require high quality water for their operations. Both estuarine habitats and water quality will be under increasing pressure in the years ahead as upstream dams that will alter the volume, timing and quality of river discharges are built and as coastal cities and their associated industries expand.

Conflicts among incompatible activities—such as fish processing and tourism—poor siting of coastal structures and the ill-conceived development activities that abound along coasts around the world are also all too apparent along Ecuador's 3,000 km shore. Not only are such mistakes expensive and avoidable but they threaten to undermine the potential for tourism that is attempting to capitalize on the sandy beaches and scenic beauty of this extraordinarily diverse coastline. The situation is further complicated by major new activi-

ties such as the search for petroleum hydrocarbons in the gulf of Guayaquil and in some areas of the continental shelf. The production of natural gas from the Campo Amistad field in the Gulf of Guayaquil is scheduled to begin in 1989.

II. A COASTAL RESOURCES MANAGEMENT AND DEVELOPMENT PROGRAM FOR ECUADOR

Ecuador faces some major challenges if it is to sustain the flow of economic benefits from existing uses of the coast, and succeed in increasing the contribution which underutilized coastal resources could make to the coastal provinces and nation.

Allocating Coastal Areas Among Competing Uses

Although much of the Ecuadorian coast is undeveloped, many different uses are trying to squeeze into the few areas where access is relatively easy. For example recreation competes with fishing for use of beaches; urban development is spreading into mangroves and flood prone lowlands; and shrimp ponds replace the mangrove ecosystems upon which shrimp larvae depend.

Environmental Quality for Coastal Fisheries and Aquaculture

Ecuador has succeeded in developing innovative uses for coastal areas, such as its vast shrimp mariculture industry. But shrimp hatcheries and ponds are now threatened by declining water quality. Specific concerns include eutrophication and declining oxygen levels, pesticide and herbicide residues, and toxic heavy metals. In addition, dam construction and irrigation projects will drastically alter the timing, quality and volume of freshwater inflow to estuaries.

The Protection and Proper Development of Tourism and Recreation Sites

Ecuador's coast has a significant unrealized tourist and recreational potential. However, existing areas are polluted, lack facilities, accessibility and development plans.

The Enforcement of Existing Laws and Policies

Ecuador has already adopted many laws relating to water pollution control, mangrove use and protection, fisheries management, and control of shore uses. These policies have been assigned to organizations that do not have adequate programs of action and enforcement of sufficient magnitude and scope to cover the coast effectively.

Formulating and Implementing Well Designed Local Development Programs

Coastal provinces lack effective mechanisms at the local level to design and implement development plans and guide urban growth and private development activities.

Although these problems are faced by many coastal nations, Ecuador must choose a strategy which takes into account its specific local circumstances, the resources available for solving coastal area problems and the level of commitment to participation in program implementation by the public and private sectors.

Placing special emphasis on the coast is timely for several reasons.

- There is already a high level of public and private investment in the nation's coastal zone and much of this investment (in shrimp farms, fisheries and tourism, for example) depends on the continued good health of coastal ecosystems.
- A large share of future economic opportunities exist in coastal areas (agriculture, aquaculture, oil and gas production and transport, urban development).
- The coastal population is increasing faster than the remainder of the country.
- Ecuador cannot afford to fix problems once they are created, such as costly water pollution control, loss of people and buildings in hazardous shore areas, coastal flooding from El Niño events.

Ecuador needs a program of action for its coastal resources which enables a variety of resource users to gain a sustained flow of benefits in terms of income, livelihood, nutrition, transportation and recreation. This in turn requires a skillful blending of national policy objectives with viable implementation mechanisms that have an impact at the local level. Successful coastal management in other countries employ technical information, local knowledge and preferences, planning studies, and implementation programs to allocate uses, mitigate development impacts and undertake restoration efforts through a continuing decision making process. The following pages put forward a specific proposal for coastal management in Ecuador.

III. THE COASTAL MANAGEMENT PROJECT, 1986-1988

Recognizing the conflicts that are emerging and the many cases of over-exploitation of the resources, the Office of Science and Technology, of the Agency for International Development (USAID) selected Ecuador as the first of three countries in which to start a pilot project on integrated management of coastal resources. (The other programs are in Thailand and Sri Lanka.) In March 1986, the government of Ecuador and USAID signed a Technical Assistant Agreement to implement the Coastal Resources Management Project (CRMP). The Office of the Environment in the Ministry of Energy and Mines (DIGEMA) and the Coastal Resources Center of The University of Rhode Island are responsible for implementing the Project. Additional support is being provided by the USAID Mission in Ecuador. The agreement provides for four years of technical and financial support for an issue-oriented program with the following specific objectives:

- To examine existing information on the condition and use of the nation's coastal resources and identify the priority resource management issues.
- To analyze the legal aspects and the institutions related to the coastal resources management and recommend tactics for more effective cooperation and enforcement of the existing statutes.
- To provide assistance in formulating a coastal policy and in the design of an improved administrative structure for managing coastal resources.

- To design a research program directed at priority issues posed by coastal ecological processes, particularly the declining water quality in estuaries.
- To improve the technical capacity of the personnel involved in coastal resources management.

At the request of the Government of Ecuador, the project began in 1986 with an assessment of the reasons for a decline in productivity in the shrimp industry during 1984 and 1985. An interdisciplinary group of environmental experts, economists, technicians and sociologists was assembled who examined the experience and information available at national and world level on this issue. Based on this information a strategy to promote the sustainable development of the shrimp industry was designed and presented in April 1987 (Olsen and Figueroa, 1987).

During the second year the Coastal Resources Management Project focused upon synthesizing available information on the condition and uses of the resources in the four coastal provinces. The Pedro Vicente Maldonado Foundation, a Guayaquil-based private voluntary organization, led this activity. The methodology included workshops in each coastal province, where causes of the existing problems and the alternatives for their solution were examined. The major result of this activity was the publication in November 1987, of "Ecuador, Perfil De Sus Recursos Costeros" (Profile of Ecuador's Coastal Resources).

Concurrent to these two major efforts at identifying specific issues for coastal management and placing them in the broad context of the development history and current needs of coastal Ecuador, a number of other activities were sponsored. Efrain Perez and Associates have examined the legal and institutional aspects of key resource management issues and have produced a computerized catalog of existing legislation as it relates to environmental management topics. A major effort is being made to assess water quality problems along the coast, with a focus on potential impacts of water pollution on shrimp mariculture. This is producing reliable data to identify the location and

magnitude of water pollution, which can be followed by source identification and consideration of practical control options. An assessment of the Ecuadorian coast from the perspective of its shoreline characteristics and processes is being completed that provides development guidelines for siting and construction of buildings and activities in the shore zone. The mangrove conversion problem is being quantitatively analyzed in pilot projects under the oversight of the project's mangrove management working group. Finally, training and public education activities are helping to strengthen the base for a sustainable coastal resources management program.

IV. COASTAL MANAGEMENT PRINCIPLES FOR ECUADOR

A series of workshops and discussions have been sponsored by the project to discuss the institutional structure for a coastal management program for Ecuador with government officials and private sector representatives. This process has led to the identification of the following ten basic principles which served as a guide in the design of the administrative components of the program.

- 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. Coastal management should not be expected to deal with all the education, health and infrastructure problems of the coastal provinces, or it will simply duplicate the missions of other government agencies, and become lost in the complexities.
- 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 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. 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. Generally this manifests itself in self-imposed limits on the exercise of enforcement authority. Occasionally it results in unnecessary duplication of government activity.
- There is a serious shortage of adequately trained enforcement personnel in nearly all agencies; also there salaries and logistic support are inadequate. The result is a high level of frustration on the part of those seeking to have the laws enforced, and a general attitude on the part of the public that the government does not really expect the laws will be obeyed.
- There are many overlapping areas of jurisdiction in government entities. In the case of Coastal Resources Management, it would be more productive to improve coordination among government entities rather than trying to reorganize the existing distribution of responsibilities.
- 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. This attitude cannot be expected to change until real improvements can be shown.
- 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.
- Apart from the need of specific mechanisms to improve coordination among government entities in aspects related to coastal resources, 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. This support will allow (a) that the different government

entities improve their cooperation and the enforcement of policies; (b) that the regional and local entities become more concerned about solving conflicts affecting their areas, and (c) that public sector and general public opinions be considered in areas that are important to their interests.

V. PROPOSED COMPONENTS OF THE PROGRAM

As a result of the first two years of work, the special resource studies, and estuarine consultation with representatives of both the public and private sectors, a set of seven components is proposed to comprise the structure of the Coastal Resources Management Program. The components are:

- Form in each of the seven Port Captain jurisdictions an "Unidad de Conservacion y Vigilancia" (Ranger Corps) comprised of enforcement personnel from all of the responsible coastal regulatory agencies, to improve enforcement of existing statutes throughout the coastal area.
- Formally designate by Presidential Decree those "Special Management Zones" where it is especially essential to improve coordination among governmental entities to deal with real or impending conflicts.
- Create **Advisory Committees** in each Special Management Zone comprised of citizens representing the full range of interests in the area, as well as of appropriate local and regional government entities.
- Establish in Quito a small, simple and precise structure to provide **high level governmental support** to the program, to assure central and political and administrative backing to solve conflicts, to obtain international support for the Program, and to promote interagency cooperation.
- Establish a **public education** program for the Republic with special emphasis on the coastal areas, in order to convey to the public the importance of the role that

coastal resource management has in the present and future of the country.

- Establish a **research** program on coastal issues directed at improving our understanding of specific resource management issues.
- Develop a **training** program at all levels participating in Coastal Resources Management.

Each of these components is addressed in turn.

A. Ranger Corps

Form in each of the seven Port Captain jurisdictions an "Unidad de Conservacion y Vigilancia" (Ranger Corps) comprised of the enforcement personnel of all of the responsible, regulatory agencies, to improve enforcement of existing statutes throughout the coastal zone.

All agencies with important regulatory responsibilities exhibit significant shortages of personnel and funds to adequately enforce the laws and regulations related to coastal resources. This deficiency leads to lack of respect for the regulations on the part of the public and an unnecessary loss of the resources. This encourages action to "strengthen" the laws by making them even more strict, thus making enforcement even more difficult. It is essential to break this cycle if the government hopes to be able to exercise sufficient control over the nation's national assets. A number of steps are suggested:

(1) The number of enforcement personnel needs to be substantially increased to assure adequate coverage of coastal areas, and a sufficient amount of support equipment, including vehicles, radios and small vessels, needs to be provided. While these changes will cost money, the alternative to this short-term investment is the permanent loss of the resources themselves.

(2) Enforcement teams should be organized with personnel from DIGMER, DINAF, the Subsecretariat of Fishing Resources and other appropriate agencies. Team members would work together in a particular geographic area, would be familiar with each others' programs and authorities, would have ready radio access to each other, and would generally support each others' duties and responsibilities. These teams, forming a unified "Ranger Corps," could be set up through a formal Ministerial Agreement.

Team members would also serve as extension agents to educate the public on the importance of coastal resource conservation. Each team would operate out of one of the seven Port Captain Offices located in coastal cities. This office would act as Coordinator for each Team of Rangers. Thus the seven teams will cover the entire coast. The problem of frequent turnovers of Port Captains could be overcome through the hiring of retired Naval officers who could be permanently located in the same community and would serve as a DIGMER member of each team.

B. Special Management Zones

Formally designate through Presidential Decree those "Special Management Zones" where it is especially essential to improve coordination among governmental entities to deal with real or impending conflicts.

In some coastal areas there are few conflicts between the operating agencies. However, a rapid alert system should be developed to allow for the protection of public and private investments in case of significant environmental impacts when they are detected; for example, a risk of water pollution as a result of agricultural practices. This system should operate throughout the coastline.

A number of other zones have been identified where a variety of development activities, nearly all funded or with permits from the national government, threaten to work at cross purposes, or to the detriment of coastal resources. It is urgent to formulate coordinate management strategies in these areas. Examples are places where the decline in water quality will threaten shrimp farm activities, shrimp larvae hatcheries and/or tourism; or where large infrastructural works could dangerously alter natural processes. If adequate management strategies are not formulated and implemented, these conflicts will result in the inefficient expenditure of limited public and private funds and an unnecessary destruction of the natural resources that serve as a base for the economy.

The answer to this dilemma is not for government to stop the activity. Rather,

the full implication of the activities needs to be openly explored and discussed by affected parties. This requires changes in the way government agencies make their decisions, and the way political pressures are exerted to get the projects done.

The proposed approach for addressing such problem areas is to designate as Special Management Zones where there are existing or potential conflicts that require issue specific strategies and interagency coordination. In order to maximize the chances of success the zones should be limited at first to one in each of the four coastal provinces.

The designations of Special Management Zones should be made by Executive Decree of the president of the Republic in order to assure compliance by all institutions, as well as to provide a framework in which to resolve differences for the overall benefit of the Republic. The designation decree should clearly lay out the geographic extent of the zone itself, the activities to be addressed within the zone, and the government agencies to be part of the Management Program.

An essential feature is that the time period be limited for formulating an integrated Plan for each Special Management Zone. This will prevent the cooperative effort from becoming bureaucratized and fossilized. Two years is probably the optimum term; by then it should be clear if the conflicts can be resolved, and differences negotiated. Less than two years may not provide for the start-up effort. More time will simply allow for unnecessary delays. Once a strategy, in the form of a

Special Area Plan has been agreed to, a second and more protracted implementation phase would begin.

The purpose for designation of a Zone should be clearly laid out, as should its manner of operating. First, an Executive Committee representing the major National agencies involved in the identified conflicts should be established. These representatives should be familiar with the changes at the local and regional level, and should be able to exercise authority to commit their agencies in the discussions and negotiations of the Executive Committee.

The Chairman of the Executive Committee of each Special Management Zone will be appointed in the Presidential Decree. Depending on the issues within each Special Management Zone, this could be the Governor or Prefect of the province, or the regional representative of one of the key national government agencies. The Chairman of the Executive Committees for each of the Special Management Zones could meet regularly to exchange experiences.

The first task of the Executive Committee should be to define more specifically the scope of the planning and coordination effort to be undertaken, and to determine if there are other national agencies that need to be invited to participate in the sessions. Once constituted, the Committee should be known formally as the "Executive Committee for the Special Management Zone of —————."

The second task of the Executive Committee should be to review the key projects and activities creating the special conditions of

conflict or resource abuse that led to creation of the Zone. Within each of these key projects and activities, major decision points should be identified and a consolidated timetable for all these discussion points should be developed. As part of the process, special efforts should be made to assure that the full implications of each decision on the resources and the other planned activities are understood before the action is taken. The development of an integrated and consolidated timetable will therefore be a major series of negotiations carried out in open forum by the representatives of key agencies.

The third task of the Executive Committee should be to expedite the decisions once a timetable and a sequence are agreed to. Various mechanisms can be used to assure timely decisions. Formal notice to agencies as a critical date approaches is one means. Another would be to set dates after which identified pending actions would be considered legally approved if they had not been specifically denied by the appropriate authority; there is some precedent for this in Ecuadorian law. Finally, the formation of a Special Management Zone could provide the opportunity to develop a "one-stop" permit system. This would unify all required approvals for a project into a single application, with an internal checking system to assure timely agency action.

The Executive Committee will be assisted by the CRMP in conducting the research and investigations necessary to understand the parameters of the projects and activities proposed in the Special Zone. To conduct this research the Committee shall,

as much as possible, rely on the technical resources of scientific and educational institutions present in the zone.

Designation of Special Management Zones

The first Zones proposed for designation are:

- In Esmeraldas:

The Atacames - Sua - Muisne Zone

Here regional tourism has the potential for significantly improving the economies of these three small towns. Development, however, is proceeding in an uncontrolled manner and the potential attractiveness of the area is severely compromised by the absence of wastewater treatment, inadequate water supply systems and the improper siting of shorefront buildings. The local economy is heavily dependent on artisanal fisheries but many coastal dependent stocks are overfished and suffering from the needless destruction of their habitats. In the Muisne vicinity shrimp mariculture on an artisanal scale not seen elsewhere in Ecuador is emerging and offers an interesting test case for a form of mariculture that could benefit poor local inhabitants. A program to define and protect the natural resources base of this stretch of coastline could directly benefit traditional fisheries and enhance the possibilities for growth in tourism.

- In Manabi:

The Bahia de Caraquez Zone

Here the key issues are maintaining the shrimp mariculture industry in the Bay and dealing appropriately with severe

coastal erosion along the ocean coast. The great majority of the Bay's once extensive mangroves have been converted to shrimp ponds and pressures are intense on the remaining fragments of this habitat and to dike off portions of the Bay itself. These wholesale changes in the ecosystem are producing unquantified impacts on the postlarval shrimp fishery and other important nearshore fisheries. Furthermore, dam projects and expanded agriculture in the Bay's watershed are likely to bring changes in water quality that may effect the viability of the shrimp mariculture operations. The town of Bahia is confronted by major decisions on the siting of a new fishing port and beachfront tourism facilities along a coast where processes of erosion and sedimentation have already caused dramatic problems.

- In Guayas:

The Playas - Posorja - Puerto El Morro Zone

In this zone the conflicts between artisanal and industrial fisheries, tourism and shrimp mariculture are intense and urgently require immediate action. The infrastructure required for the important fisheries of the zone is inadequate and fishermen compete directly with tourists for sandy beaches. Problems of waste disposal and inadequate sewage treatment become acute in the tourism season. Declining water quality is of concern to tourists and mariculturists alike. Here, too, pressures to convert the remaining mangroves into shrimp ponds are intense. Land use controls are required to impose some order on second home developments, mariculture and polluting industries that are all expected to continue to rapidly expand in the next decade.

- In El Oro:

The Machala - Puerto Bolivar Zone

Water quality problems are most acute in this area. Pesticides and herbicides are believed to be affecting human health and have made several shrimp hatcheries inoperable. As in Esmeraldas, the stocks that support artisanal fisheries are rapidly declining and wholesale changes to the ecosystem are being brought by the uncontrolled proliferation of shrimp ponds.

C. Advisory Committees

Create Advisory Committees in each Special Management Zone comprised of citizens representing the full range of interests in the area, as well as of appropriate local and regional government entities.

There is a strong feeling among those who have participated in formulating this proposal that successful coastal management efforts in Ecuador require active involvement by interested parties from both the public and private sectors. There are three main reasons:

- (1) There is a high level of interest and concern for the present and future quality of coastal resources. This concern has emerged from several coastal ecology studies carried out for the shrimp farmers, who want secure supplies of good quality water and seed shrimp for their ponds.
- (2) Many public policy issues and choices involved in coastal resource management should evolve from open discussion and debate building upon the style developed

through formulating the Environmental Profiles of the coastal provinces.

(3) The education and the evolution of a civic consciousness concerning Ecuador's coast and its resources will be greatly strengthened if meaningful public participation is built into issue definition and the formulation of management strategies.

The institution suggested to handle these requirements is an Advisory Committee of citizens, to work with the Executive Committee of each Special Management Zone.

The Advisory Committee would be comprised of representatives of major private sector interests, such as shrimp farmers, shrimp hatchery owners, larvae collectors, fishermen, fish processors, other industrialists, hotel owners, environmental foundations and clubs, universities, etc. Membership should also include representatives of local and provincial councils, regional planning and development bodies and national agencies with interest in coastal issues but not with sufficient regulating authority to justify membership on the Executive Committee. The Advisory Committee would formulate opinions and suggestions for each step of the Executive Committees' work in the Special Area Management Zone, as outlined under Section 2 above.

Being tied to a Special Zone would give the Advisory Committee a two-year life to operate; in this way, it would not go through a period of decline, as many such committees do before they are disbanded. As adviser to the Executive Committee, the Advisory Committee would be in the best

position to provide views on the conflicts under resolution and on the various plans, timetables and projects under review.

D. Central Government Structure

Establish in Quito a small, simple and precise structure to provide high level governmental support to the program to assure central, political and administrative backing to solve conflicts, to obtain international support for the Program, and to promote interagency cooperation.

There are a number of essential elements to the program that require high level authority.

- (1) To assure a sufficiently strong base of political and administrative support to resolve conflicts and enforce cooperation by all agencies.
- (2) To provide a mechanism to assure the observance of the Executive Degrees in the creation of the Special Area Management Zones and other aspects of the program.
- (3) To facilitate access to international institutions; interest in Ecuador's coastal management innovations will likely provide opportunities to obtain funds for the program from public and private groups, as well as requests for information from other nations wishing to learn from the Ecuadorian experience.
- (4) To develop a public awareness program aimed at the general population, concerning the coastal resources of the nation.

Several alternatives were identified and analyzed to place this structure within the Central Government. Among those considered were: CONADE (the national planning agency) or a group under this entity; individual Ministries; an Inter-ministerial Council; an agency connected directly to the Presidency, and a group attached to the General Secretariat of Public Administration. This last alternative combined with an inter-ministerial council, is the preferred approach.

The proposal is to constitute, through an Executive Decree, an inter-ministerial group including those with the greatest interests in coastal resource management, under the name of the Interministerial Committee for the Management of Coastal Resources. The President of this Committee would be the Coordinator of Administrative Development in the Office of the Presidency; this Office is part of the General Secretariat of Public Administration, and has direct access to the President of the Republic.

A Technical Secretariat will further support the President of the National Committee and the Executive Committee in the Special Zones. It will administer the various components of the Program. The Technical Secretariat must have enough strength and capability to coordinate and promote the tasks defined by the Executive Decree and the Inter-ministerial Agreements for the integrated management of coastal issues. It will provide technical support to the different levels of the program, both at the policy level in Quito and with the groups participating in the Special Management Zones. This Secretar-

iat would be organized from the DIGEMA-PMRC Office that is operating now in Guayaquil.

E. Public Education

Establish a National Public Education Program, with special emphasis in coastal areas, to increase the public's awareness of the importance of proper management of coastal resources for the present and future of the country.

If a significant portion of the people most directly affected by the Coastal Resources Management Program do not understand its goals and support the actions being taken, the Program will fail. The three years of work undertaken by the CRM Project has identified the major themes for a public education program and the target audiences. The resources must now be assembled to develop materials for newspaper articles, radio and TV to make people aware of the key issues the Program is attempting to address and the importance of resolving them. A strong base for building such a program exists thanks to the remarkable success of Fundacion Natura's environmental education programs and the excellent contacts of Fundacion Maldonado along the coast.

F. Research

Establish a Research Program on coastal topics directed toward improving our abilities to manage coastal resources.

The main objective of this program will be to support research that will directly assist in making appropriate resource management decisions. The CRMP Working Groups, such as those established to oversee the Mangrove Ecosystem Management and the Water Quality Initiative, should serve as prototypes of the level of structure required to orient, coordinate and evaluate results. Three top priorities for research have been identified that will require significant long-term funding. The first is to address the potentially catastrophic impacts of a collapse in shrimp stocks due to a combination of overfishing and habitat destruction. The wild stocks support a 260-vessel trawler fleet, an artisanal postlarvae fishery that is the major supplier of seed shrimp for the mariculture industry and a gravid female fishery that supplies the shrimp hatcheries. The postlarvae fishery involves 50 to 100 thousand fishermen and has brought an economic renaissance along stretches of the coast. A well conceived research program is needed to differentiate among stocks, monitor recruitment and fishing mortality and provide a basis for regulating fishery effort. Key habitats within estuaries need to be defined and protected. Another priority is to set up a sustainable water quality monitoring system targeted on those variables and sites known to be particularly important to the continuing viability of the mariculture industry. The monitoring must be complemented by research that documents the impacts of those pollutants that are known to pose

major concerns. The third priority is to better understand the role and functioning of Ecuador's mangrove systems in water quality, flood control and as a key habitat for commercially important fish and shellfish.

G. Training

Improve the technical capacity of those persons involved with the management of coastal resources.

The objective of this program will be to train personnel involved in coastal management activities, with special attention given to the training of the seven teams of the Ranger Corps to help them carry out their enforcement and extension duties.

Ranger Corps programs will include training in coastal ecosystems, their importance and value; objectives for management of coastal resources, relevant laws and regulations; and public education/contact techniques. A major objective of the ranger training programs will be to enhance the stature of the Corps within government and to build their credibility with the private sector and general public. Training of policy makers and government technocrats is also essential for an effective CRM Program. A high level, prestigious policy seminar series is envisioned for the policy makers. Appropriate forums for training that combine representatives from these three groups will be included in the overall training program.

ANNEX I MANIFESTO

MANIFESTO

To the President and Vice-President Elect and the Nation: A Call for the Balanced Development of Coastal Resources

Local officials, Representatives to Congress, businessmen, university presidents, leaders of political parties, public servants in governmental and developmental agencies, experts, journalists and other representatives and members of the regional community have all participated in the preparation of a proposal for the management of resources in the coastal zone.

This proposal reflects the will of each of the coastal provinces and constitutes a common commitment to join together, and unify, public and private initiatives in order to achieve the priorities we have together identified for coastal development.

This is the first time that such an initiative has been formulated in the country. We trust that the next administration will transform the will of the region into tangible actions and statements of national policy.

We have considered the following:

- Almost all productive activity along the coast depends upon renewable resources. This rich base for development will be sustainable only if it is managed and administered in a balanced manner.
- The majority of the region's population is concentrated along the coast. The four major coastal cities already contain 38

percent of the urban population of the country.

- There is not a single activity or sector in the national economy that is not directly or indirectly linked to the use of our coastal resources.
- The income generated by marine resources in 1987 was three times that produced by industry (excluding petroleum); was equivalent to those produced by coffee, cocoa and bananas combined; and was 65% of those generated from petroleum.
- Excepting those associated with petroleum production, the most profound and complex changes that have occurred in the country are seen in coastal areas and ecosystems.
- These major changes, (ports, roads, tourism, dams, shrimp farms, fishing, population growth, urban development, pollution, ecosystem destruction, deterioration of the environment) have all occurred in the past 20 to 30 years, or are taking place today, and the associated problems, impacts and dangers have yet to be fully manifested.
- All indications are that coastal areas will experience rapid growth, assume growing importance, and be subjected to the increasing pressures and conflicts..

These and other concerns were reviewed in a series of provincial workshops during which the following key problems and issues were identified:

- Deterioration in water quality caused by urban, industrial and agro-chemical discharges.

- Degradation of mangrove ecosystems.
- Threat of extinction of some resources.
- Chaotic and conflicting use of coastal lands.
- Fragmented legal and administrative functions, uncoordinated and overlapping jurisdictions, and disregard of coastal and environmental laws.
- Lack of awareness in the regional and national community of the changes to the resource base which have taken place over the past few decades and of their implications.
- Limited research on topics that could contribute to the resolution of priority problems.

These factors tend to create a situation which in a few years could become critical and possibly irreversible. If this occurs, the disastrous outcomes will multiply.

Because of our political, social and familial responsibilities, we declare that it is essential, if we are to continue the development of our country and to provide for our children and future generations, that we correct the current deficiencies and utilize renewable resources for sustained production and not exhaust them. It has become clear during the workshops that this will be possible only if simultaneously with the enactment of decrees and legislation we transform the attitude of communities toward these problems. To this end we propose to:

1. Unite the necessary governmental institutions and private sectors linked to coastal resources with integrated management strategies.

2. Transform the Coastal Resources Management Project into a Governmental Program, with a flexible and simple structure that secures political support of the national government, efficient local management and the active participation of the community.

3. Provide adequate means for ensuring the compliance with and execution of the laws and regulations that govern the coastal zone and its resources.

4. Launch these initiatives in the Special Management Areas selected by each province.

5. Support programs of education, training and research related to coastal issues.

6. Implement a strong management program for the protection of water quality and mangrove ecosystems along the entire coast.

The great diversity within the group that has endorsed this manifesto, a group that also cuts across the political spectrum, is a clear expression of cooperation and democracy and of a common concern to avoid the degradation of the renewable coastal resources which sustain the national economy.

We call upon our elected government officials to endorse and support this new initiative which has been shaped in the coastal provinces through a closely coordinated and collaborative process.

July 22, 1988

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ANNEX II

PROFILE OF GOVERNMENT AGENCIES RELATED TO THE MANAGEMENT OF COASTAL RESOURCES

A number of public institutions are currently active in the management of coastal resources. Others are potentially important because of the impact that their activities have or might have in the future of coastal resources or could participate if their tasks were modified or clarified. Finally, the creation of new entities or the reorganization of present authorities have been suggested to fill in some gaps or deal with weaknesses in the present structure. This annex presents a brief profile of the most important agencies related to coastal management, and then offers a list of suggestions made by those interviewed on how present authorities might be restructured.

The strong consensus of those interviewed was that it was preferable to improve the existing structure rather than reorganize it to meet the objectives of coastal management. This point of view recognizes that reorganization by itself seldom results in the kind of management improvements that are considered important. Some of the suggested organizational changes are worth bearing in mind as the coastal program takes shape.

KEY NATIONAL AGENCIES FOR COASTAL MANAGEMENT

The Merchant Marine and Coastal Service of the Ecuadorian Navy (DIGMER)

This agency has full regulatory authority over all activities in coastal waters and adjacent beaches, generally up to eight meters from high tide, and regulates all municipal and industrial discharges into

coastal waters. Although it is a respected institution, DIGMER suffers from shortages of manpower and resources to enforce existing laws and regulations, especially those related to pollution from untreated discharges. Activities are well organized under seven Port Captains at major locations, whose authority extends throughout the entire coast. DIGMER is a key asset to any successful coastal management program. However, a leadership role is made difficult by the practice of changing Port Captains frequently to meet other career objectives of the officers, and by the general public concern over reliance on what is essentially a military force to carry out the program.

The National Forest Service (DINAF), Ministry of Agriculture and Livestock

DINAF has regulatory authority over mangroves and designated forest areas in the coastal zone. It has suffered from a severe shortage of enforcement personnel and resources, which has not allowed for the control of forestry exploitation practices. However, the illegal destruction of mangroves for the construction of shrimp ponds appears to be happening at a slower rate than in previous years as the shrimp industry begins to see the danger of the continuous destruction of a habitat crucially important to the sustainability of their industry.

The Subsecretariat of Fisheries Resources, Ministry of Industry, Commerce, Integration and Fisheries

This agency regulates all fisheries-related activities in the coastal zone, including approval of all shrimp farms (in coordina-

tion with DINAF and DIGMER). In addition, it assists in the encouragement and development of both artisanal and industrial fisheries. At the same time the agency has responsibilities in the conservation of fisheries habitats in coastal areas. In general, it is thought to handle its regulatory, developmental and conservation roles well, with a minimum of conflict.

OTHER NATIONAL AGENCIES RELATED TO COASTAL MANAGEMENT

The National Development Council (CONADE)

This is the national "super agency" for the planning and approval of development projects. Although the Coastal Resources Management Project does not contemplate a program that will either seek to carry out specific development projects, or try to develop a "plan" for the entire coast, the support of CONADE will be essential to convincing the various ministries and independent authorities that the improvements proposed in coordination of activities and enforcement of regulations are worth pursuing.

The Ecuadorian Institute of Hydraulic Resources (INERHI)

This Institute is involved in the planning, design and construction of a large number of upstream dam projects. These projects have important effects on coastal areas ranging from the reduction of freshwater flow into estuaries to problems in the drinking water supplies for coastal communities. The Institute's main interest is

related to the irrigation of farmlands. To date there has been little involvement in coastal issues.

The Ecuadorian Institute of Sanitary Works (IEOS)

This Institute has a broad charter to deal with water quality and pollution issues on a broad scale, but has focused nearly all its efforts on the provision of safe drinking water and water treatment works in rural areas. It sees itself as a development agency with no regulatory role.

The Office of the Environment, Ministry of Energy and Mines (DIGEMA)

This is the sponsoring agency for the Coastal Resources Management Project. Although it attempts to take a broad view of the full range of environmental issues facing the Republic, it must do so from its current location within one of the ministries. In addition, it exercises no regulatory authority over coastal resources. Nonetheless, it serves an important liaison function for the development of a coastal management program, in part precisely because it is not a threat to existing regulatory authorities or developmental interests.

The National Tourism Office (DITURIS)

This agency is responsible for the programming, development and supervision of tourist activities in Ecuador. While it has no regulatory powers, it has established good working relations with local governments in those areas with potential tourist activity, which helps its integration into a coastal management program. In the coast this is particularly important because of

the large economic role that tourism plays during the winter season. Relations between DITURIS and the other national agencies with responsibilities in the coastal zone do not appear well developed.

LOCAL AND REGIONAL AGENCIES

Study Commission for the Development of the Guayas River Basin (CEDEGE)

This commission is working on the project of the Daule-Peripa Dam, in the Guayas Basin, which includes new irrigation areas, flood control, water transfer to the Santa Elena Peninsula and to the Province of Manabi and the generation of electricity. Its activities may have significant impacts on the quality and quantity of freshwater flow into the estuary. Commission staff are increasingly aware of these issues and are studying possible project impacts.

Program for the Development of the South (PREDESUR)

This Institution operates in the province of El Oro and in adjacent highland areas. Because of its activities and the impact they have on the Gulf of Guayaquil, PREDESUR should participate in the coastal management process.

Municipal and Regional Service Corporations

There are a number of important services, such as the provision of drinking water and sewage collection and treatment, that are carried out by local and regional service corporations. Probably the most important of these is the EMAG, the

Municipal Sewage Corporation of Guayaquil. The decisions taken by EMAG in coming years with respect to the treatment of domestic and industrial water discharges, waste disposal, etc., will be critical for the management of the Guayas River estuary and the Estero Salado.

Provincial Councils

These are entities for the planning and development of the provinces. They have focused mainly on the development of roads and school infrastructure. The perspective of the Provincial Council should be included in the consultation process through the Advisory Committees to help resolve conflicts and make necessary choices.

Cantonal Councils

Like the Provincial Councils, the local councils in each canton affected by the Special Area Management Plans should have a part in the development and the operation of the coastal resources management process.

CHANGES SUGGESTED IN THE STRUCTURES OR CHARGES OF GOVERNMENT ENTITIES

Although in some interviews suggestions were made to change the existing structure of government agencies or to alter their tasks and charges, the general consensus was that the improvement of cooperation among existing authorities is more important than the creation of new institutions and regulations. The major suggestions were the following:

1. Expand the charter of the Hydraulic Resource Agency (INERHI) to require full consideration of the effects of projects on downstream flows and estuarine resources. It appears that the agency is already beginning to do this, and it is not clear that changing the charter of the agency will speed up the process.
2. Expand the charter of the Sanitary Works Agency (IEOS) to include nationwide supervision of all aspects of water quality. This could assure the enforcement of water quality standards and control water discharges that could be important sources of chronic contamination. Currently there is no agency with nationwide authority to regulate water quality.
3. As DIGMER has enough authority in coastal areas to control all kinds of discharges, the main point to consider would be to strengthen the operative capacity of this entity and assure coordination with INERHI and IEOS.
4. Create a Ministry of the Environment or Ministry of the Environment and Renewable Natural Resources. It is not to be assumed that the integration of numerous government units related to natural resources in one Ministry will solve existing administrative problems related to the management of coastal resources. Furthermore, it is not clear what units should be part of such a new Ministry. Some suggested that the fisheries section should remain in the Ministry of Industry, Commerce, Integration and Fisheries; and others suggested that it should be part of the new ministry mentioned above. No one suggested moving DIGMER from Defense to the new Ministry, but DIGMER has much of the regulatory authority in the coast. However, some think that a Ministry with interests and responsibilities on the natural resources of the Nation would bring the advantage of focus on environmental problems.
5. Create an Institute of the Environment or of Natural Resources. This option has similar advantages as the previous one with the exception that there would be no integration of existing agencies. The National Congress is considering a project to create an Institute with these characteristics.
6. Establish a National Comptroller for the Environment to oversee all activities of agencies related to natural resources. This concept is relative new and is still being developed; it is an interesting idea for overall monitoring of public and private activities.

ANNEX III

NAMES OF PARTICIPANTS IN THE DISCUSSION WORKSHOPS ON THE STRUCTURE AND OBJECTIVES OF A COASTAL RESOURCES MANAGEMENT PROGRAM IN ECUADOR

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February 26, 1988

ANNEX IV SELECTED ECUADOR CRM PROJECT PUBLICATIONS

- A Collaborative Effort in Developing the Integrated Coastal Resources Management Project for Ecuador. Coastal Management Volume 15. pp. 97-101. S. Olsen. 1987.
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- Recopilacion Preliminar de las Normas Legales y Administrativas Ecuatorianas Aplicables al Sector Camaronero. Abg. E. Perez. 1986.
- Legal and Institutional Issues of the Galapagos Reserve of Marine Resources. E. Perez. 1987. (available in English and Spanish).