AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT DATA SHEET

1. TRANSACTION CODE: A (A = Add, C = Change, D = Delete) — Amendment Number: ____ — DOCUMENT CODE: 3

2. COUNTRY/ENTITY: El Salvador

3. PROJECT NUMBER: 519-0385

4. BUREAU/OFFICE: Latin American and the Caribbean — LAC

5. PROJECT TITLE (maximum 40 characters): Environmental Protection

6. PROJECT ASSISTANCE COMPLETION DATE (PACD): MM 03 DD 31 YY 99

7. ESTIMATED DATE OF OBLIGATION (Under B.," below, enter 1, 2, 3, or 4)
A. Initial FY 93 B. Quarter 2 C. Final FY 97

8. COSTS ($000 OR EQUIVALENT $1 =)

A. FUNDING SOURCE	FIRST FY B. FX	C. L/C	D. Total	LIFE OF PROJECT E. FX	F. L/C	G. Total
AID Appropriated Total			246	13,815	6,815	20,000
(Grant)	( )	( )	(246)	(13,815)	(6,815)	(20,000)
(Loan)	( )	( )	( )	( )	( )	( )
Other U.S. 1.						
Other U.S. 2.						
Host Country			68			7,000
Other Donor(s)						
TOTALS			314	13,815	6,815	27,000

9. SCHEDULE OF AID FUNDING ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE 1. Grant	2. Loan	D. OBLIGATIONS TO DATE 1. Grant	2. Loan	E. AMOUNT APPROVED THIS ACTION 1. Grant	2. Loan	F. LIFE OF PROJECT 1. Grant	2. Loan
(1)									
(2)									
(3)									
(4)									
TOTALS									

10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each)

11. SECONDARY PURPOSE CODE

12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)
A. Code
B. Amount

13. PROJECT PURPOSE (maximum 480 characters)

To halt and then reverse degradation of El Salvador's natural resource base to safeguard year-round water supplies and rural incomes.

14. SCHEDULED EVALUATIONS
Interim MM 09 YY 95 MM YY Final MM 10 YY 98

15. SOURCE/ORIGIN OF GOODS AND SERVICES
☒ 000 ☐ 941 ☐ Local ☐ Other (Specify) ____

16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a ____ page PP Amendment.)

Methods of Implementation and Financing Approved.

Douglas W Arnold

17. APPROVED BY
Signature: John L. Lovaas
Title: Acting Mission Director USAID/El Salvador
Date Signed: MM 04 DD 01 YY 93

18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION
MM DD YY

A

ENVIRONMENTAL PROTECTION PROJECT
519-0385

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Environmental Protection Project
519-0385

I. SUMMARY, ISSUES AND RECOMMENDATION

A. Summary

Since 1989, El Salvador has benefitted from GOES policies and programs which encourage strong economic growth. Its macroeconomic policy promotes efficient investment and a stable currency The war ended in 1992 and a far-reaching national reconstruction program is underway. Judicial and electoral reforms negotiated as part of the peace accords are increasing civic participation in an emerging pluralistic society. The GOES also has instituted measures which promote longer-term economic stability, such as privatization of banks and agricultural enterprises, improvements in basic and vocational education, and land reforms

Since 1991, the GOES has included sustainable management of natural resources and the environment among its national programs. Since then, natural resource management and its economic and social costs have been debated in a wide range of public fora Electricity rationing in 1992 disrupted factory production and highlighted the reduced storage capacity of reservoirs and the need for reforestation to slow further loss of capacity. Exhausted aquifers led to the construction of a $200 million aqueduct to supply metropolitan San Salvador. The financial cost to large infrastructure and the economic activity it supports is becoming clearer as unsustainable use of water and soil continues Small farmers who convert hillsides to cropland lose their most productive soil to erosion, while rural women and children spend increasing amounts of time gathering firewood and carrying water. These poor families, through unsustainable agriculture, are incurring implicit costs to themselves as they work harder for the same or less economic gain These costs to large and small activities alike now drive an incipient dialogue among people in government, academia, and special interest groups. However, the majority of the population has yet to join in the discussions.

Both the political right and the left agree that the environment and natural resources management are important areas for action, although solutions to the problems are likely to be controversial The newly rising culture of democratic participation, a product of the peace accords, offers the means to build consensus on what should be done. Regulators and resource users can now submit natural resource management decisions to a variety of municipal and national tests of acceptability, balancing the need for immediate use of such resources as wood, water, and coastal areas with anticipated future use The social and economic costs can be compared and discussed in a more open and free manner

Yet this consensus-building on the effective rationing of natural resources presupposes a general understanding of how society uses natural resources. Government and private institutions need the capacity to analyze competing policy options and to help prescribe solutions to competing uses of natural resources. In El Salvador, neither a general understanding of natural resource management nor institutional capacity to promote sustainable resource use have yet developed.

To assist in solving natural resource management issues, USAID proposes to finance the Environmental Protection Project, a six-year, $20 million grant to the GOES. The Project Goal is to improve environmental and natural resource management. The Project Purpose is to halt and then reverse degradation of El Salvador's natural resource base to safeguard year-round water supplies and rural incomes.

Assistance provided through the Project's three components will assist the GOES Executive Secretariat for the Environment to: (1) develop and implement effective environmental norms and policies; (2) promote environmental education and awareness programs; and 3) promote the adoption and replication of sustainable natural resource management practices.

By the end of the Project, the GOES will have enacted and implemented key policy reforms in natural resource management, including establishing a source of financial support for NGOs. This will be reflected in the laws themselves, the regulatory and juridical framework, and the capacity to monitor and enforce the new legislation. Support for sustainable management of natural resources will be taken into account by policy-makers in the Social and Economic Development Committees of the Executive Branch, the Environmental and Health Committee and others in the Legislative Assembly; environmental, health, and agricultural special interest groups; school-aged children; and the population at large. Proven natural resource management practices and methodologies for their transfer will be available for adoption throughout El Salvador They will serve as a model for local participation in land use decisions, socially acceptable regulation, economically sound incentives, and viable alternatives for development of local organizations.

Table 1. El Salvador. Environmental Protection Project
Summary Budget
($000s)

		USAID	Counterpart	TOTAL
1	Policy Formulation and Reform	7,200	2,400	9,600
2	Demonstration of Benefits	6,800	3,500	11,300
2.	Environmental Education	4,000	1,100	5,100
4	Management/Evaluation/Audit	2,000	0	2,000
	TOTAL	20,000	7,000	27,000

Recommendation

The Project Design Committee recommends the approval of this Project Paper for a $20 million, six-year grant to the Government of El Salvador to halt and then reverse degradation of El Salvador's natural resource base to safeguard year-round water supplies and rural incomes

II. PROGRAM FACTORS

A. Country Setting

El Salvador must balance short-term gains made at the expense of fragile rural lands and coastal area, against the long-term viability of these natural resources At issue is the unsustainable exploitation of land and water, the principal source of rural incomes and urban development. The capacity of El Salvador's natural resource base to sustain economic growth is diminishing to the point of peril. Of the original forest, 98 percent has been cut. Soil erosion seriously affects more than 50 percent of all land. Losses to erosion in the upper Lempa watershed are documented at nearly 50 tons of soil per hectare annually At this rate, each square meter is stripped of about an inch of soil each year; an average of 20 inches of productive soil on a small holder's hillside farm are gone in a generation. Approximately half the Salvadoran population is rural, eking out a subsistence on steep slopes that cannot sustain profitable cultivation under current practices.

Deforestation in El Salvador occurs principally for conversion of wooded land to agriculture. El Salvador's major watersheds are severely deforested, especially the Lempa River watershed which covers almost half the national territory. Its streams carry the load of eroded soil into reservoirs, where it settles. The effect of siltation behind the five hydroelectric dams has reduced their capacity by nearly 50 percent since they were built 20 years ago. This reduced capacity was clearly evident during February to May of 1992 when the drought was at its peak and electricity was rationed up to eight hours a day. The IDB, with Japanese cofinancing, will undertake a major project in 1993 to manage the upper Lempa watershed to reduce siltation and contamination

About 12% of El Salvador (327,000 ha.) remains under forest, including the mangroves on the coast. Data show that 51 percent of all energy in El Salvador is derived from fuelwood, annually consuming over four million metric tons Annual consumption exceeds sustainable supply by the equivalent of 50,000 ha. In rural areas, fuelwood accounts for 92 percent of energy consumed Because of its increasing scarcity, the price of fuelwood in the cities has risen 1,200 percent since 1980, compared to 450 percent for gas and 100 percent for the minimum wage. Three-quarters of fuelwood in rural areas is not purchased but gathered from scrublands, fence rows, and individual trees. Collecting firewood requires four to five hours daily to meet rural families' energy needs. Thus, the loss of tree cover contributes significantly to the cost of households in time and money as fuelwood becomes more scarce.

The situation is equally severe for water resources. The average time required each day for a family to obtain water from wells or streams has increased four-fold due to lower water tables and greater distances involved, compared to 15 years ago. Ninety percent of rivers are polluted with sewage, agricultural runoff, industrial waste, and sediment Because El Salvador has no functioning sewage treatment systems, raw sewage and a variety of industrial contaminants flow directly into rivers. A 1991 rural water quality study showed that fecal contamination in 11 wells and 19 river samples in the Barra de Santiago area exceed by more than 200 times the World Health

Organization standard. Intestinal diseases from such contamination are the leading cause of death for children in rural areas. Red tides, exacerbated by sediment and toxins, are now frequent and last several months, damaging marine industries and posing health and ecologic risks. The catch of white shrimp has declined 60 percent in 20 years, and requires three times the trawling effort to harvest the same amount. Catches of lobster, rock crab, and grouper are down even more Despite the tendency towards overfishing, catches could be increased if pollution and sediment in rivers were reduced Although cotton production has declined nearly 90 percent since 1980, there has not been a comparable reduction in imported pesticides. Continued pesticide use and contamination problems still abound.

Despite El Salvador's small size and serious environmental deterioration, its level of biodiversity (as measured by species present in mangroves and protected areas) roughly equals that of the United States. Unfortunately, protected land which theoretically shelters most of the biodiversity, as a percentage of total area in El Salvador, is less than 0.6 percent, compared to 9 percent in the U.S. Important laws for habitat protection have languished in the National Assembly since before the war.

In 1991, the GOES demonstrated its commitment to addressing environmental issues by creating CONAMA, the National Council for the Environment, and its operational entity, SEMA (Secretaria Ejecutiva del Medio Ambiente). The end of civil conflict in January 1992 allowed the Government of El Salvador to assign a high priority to addressing natural resource issues. There is increasing international donor support for NRM programs in El Salvador, demonstrated by planned projects by the World Bank, the IDB and Japan, and UN agencies.

SEMA has begun to administer small NGO grants and initial planning and coordinating activities in the public sector. A National Environmental Emergency Plan was developed by SEMA in 1992 and received GOES endorsement. NGO involvement in natural resource management, although nascent, is increasing. The problems of El Salvador's environment are seen by both the people and the government as having an important impact on the nation's economy and quality of life. Grassroots environmental NGO's are drawing attention to the importance of sustainable use and protection of El Salvador's remaining natural resource base, and in particular, the few existing designated protected areas. Yet GOES and NGO environmental institutions are still new and without the skills, capacity or resources needed to adequately address and resolve the problems shown above.

B. Host Country Institutions

Decree No 73 of January 1991 established CONAMA with a mandate "to foster the optimum and rational utilization of natural resources, control contamination of the environment, and re-establish an ecological equilibrium". CONAMA consists of representatives from all twelve GOES ministries, the Office of the Presidency, and the Salvadoran Institute for Municipal Development (ISDEM). CONAMA and its coordinating and monitoring unit, SEMA, is the highest GOES body authorized to define, formulate and monitor environmental policy.

SEMA is located in the Ministry of Agriculture (MAG) with funding from the Ordinary Budget and, through 1993, also from the Extraordinary Budget. Its

responsibilities carry beyond the natural resource agencies in the MAG to other Ministries. These include the Ministry of Education (environmental education), the Ministry of Public Works (urban water systems), the Ministry of Economy (electrical generation), and the Ministry of Health (rural potable water). To reflect this broad responsibility, an Executive Decree is under development to give SEMA formal multisectoral authority.

An Environmental Conservation Fund (FOCAM) is to be functioning by June 1993, supported in part by the Decmber 1992 Enterprise for the Americas Initiative debt forgiveness agreement. FOCAM will be the primary Salvadoran funding mechanism for NGO environmental projects in the future. The EAI account within FOCAM will be capitalized by local currency interest payments on remaining PL-480 and USAID debt, yielding an estimated $27.0 million through December 1999 The EAI debt forgiveness program will follow models created in Bolivia and Jamaica. The Canadian government agreed in January 1993 to convert $7 million of official debt into capital for FOCAM The IDB is also considering making resources available to the fund.

The Agriculture and Natural Resources Office advises USAID management concerning coordination of U.S. efforts for EAI legislation and participation in the FOCAM fund. The Mission Director will represent the United States on the FOCAM Administrative Council, responsible for the review and approval of NRM proposals for accessing EAI/FOCAM project funding.

Implementation of environmental and natural resources activities is fragmented among a number of GOES entities. Institutionally weak, they have been unable to lead the development of an ENRM agenda. In addition to SEMA, the GOES environmental entities participating in the Project include:

- Agricultural Technology Center (CENTA), responsible for agriculture extension and agroforestry operations;

- Directorate General for Natural Resources (DGNR), responsible for national park and forestry management and supervision;

- Center for Fisheries Development (CENDEPESCA), responsible for coastal zone management including fisheries and mangroves, and

- National Geographic Institute (IGN), responsible for the maps required for the management of natural resources.

A number of environmental NGOs, recently active and as yet poorly financed, have sponsored geographic areas or biologic specialties. Their incipient administrative capacity still prevents them from undertaking complex programs. FESA (Fundación Ecológica Salvadoreña Activa 20-30), AMAR (Amigos del Arbol), and FUTECMA (Fundación Tecleña pro Medio-Ambiente) have active boards of directors and are initiating fund-raising programs The former two have received funding from international donors, as has CESTA (Centro Salvadoreño de Tecnología Apropriada).

Table 2. El Salvador. Environmental Protection Project
Principal Nongovernmental Organizations

NGO	Annual Budget	Members	Paid Staff	Specialty
ASACMA	$ 5,000	50	1	environmental education
AMAR	50,000	50	1	mangrove and turtle protection
Audubon Society	5,000	50	1	bird habitat
CESTA	100,000	200	42	appropriate technology
FESA	100,000	200	7	general ecology
MES	5,000	200	2	general ecology
FUREMAR	0	50	0	marine species
FUTECMA	10,000	100	2	green spaces, environmental education
Montecristo Foundation	10,000	50	1	environmental education
Amigos de la Tierra	10,000	500	0	agricultural education
Amigos de la Playa	5,000	50	1	beach ecology

C. Relationship to USAID Objectives

The A.I.D. Economic Assistance Strategy for Central America states that "Greater emphasis will be given to encouraging Central Americans to adopt economic policies, incentives, regulatory frameworks, and management practices which promote the protection and sustainable use of the natural resource base". PROMESA supports the Central American Strategy, as well as the objectives of A I D.'s Environmental Initiative, by promoting sound economic policies, developing and strengthening national capabilities to manage natural resources with the help of both the private and public sectors, and promoting technology transfer The Project directly responds to the Administrator's September 1990 Environment and Natural Resource Announcement, the LAC Bureau's March 1989 Environment and Natural Resources Strategy for Central America, the LAC regional Strategy for Agriculture and Natural Resources, and the Mission's April 1991 Natural Resource Management Strategy In particular, the LAC Regional Strategy focuses on forest and soil conservation, the two primary areas to be addressed by the Project.

The PROMESA Project directly addresses the El Salvador Mission's Strategic Objective #5 Improved Environmental and Natural Resource Management. The project components help create and implement natural resource use policies, increase public awareness of environmental problems, and improve productive activities consistent with better natural resource management.

D. Relationship to Other US Government Programs

The Project will work in concert with other Mission programs. Under the Strengthening Achievement for Basic Education Project (SABE), USAID is

assisting the revision of the public school curriculum from kindergarten through the sixth grade. In coordination with SABE, the Environmental Protection Project will help the Ministry design and implement environmental education within the new curriculum. The Environmental NGO Strengthening Project (SENS) supports up to eight NGOs in natural resources management programs, some of which are expected to work later on with the Environmental Protection Project. The Environmental Protection Project will also utilize the Central and Latin American Scholarship Program (CLASP) for U.S. participant training in natural resources management. CLASP has already trained 21 environmental educators and 50 environmental promoters. An additional 75 training slots in environmental and natural resources management are planned during 1994-96.

The sustainable use of agricultural land is intertwined with appropriate farming practices USAID has promoted proper use of agricultural pesticides in fifty agrarian reform cooperatives through the Rural Enterprise Development and the Nontraditional Agriculture Export Production and Marketing Projects. The Coffee Technology Transfer Project will further promote controlled use of pesticides as well as environmentally sound hillside farming practices.

The Project will also coordinate with and procure technical assistance from regional and centrally managed projects. A buy-in contribution to the RD Bureau's Environmental Education and Communication Project (GREENCOM) will implement the environmental education component of the Project. The R&D/AG Environmental and Natural Resources Policy Analysis and Training Project (EPAT) will furnish software for modelling policy analysis. The ROCAP Natural Resource Management Project (RENARM) will provide technical assistance in policy, environmental education, and management of protected areas. Agroforestry assistance may be obtained from the Tree Crop Dissemination component of RENARM.

The Project design anticipates the arrival of the Peace Corps in El Salvador in late 1993, with a substantial number of volunteers in place by 1995. Preliminary discussions with Peace Corps planners indicate that one program emphasis will be environment and natural resources, the Project's demonstration area is proposed as a site for placing Volunteers. Technology and practices from the demonstration area will be made available to volunteers as appropriate for replication in other parts of El Salvador.

E. Other Donor Activities in Natural Resources Management

The IBRD's proposed second Structural Adjustment Loan (SAL II), expected to be approved in September 1993, will contain conditionality on El Salvador's legal framework regarding the environment and the development of the national ENRM Strategy The IBRD has coordinated closely with USAID in developing its conditionality which, in its current form, will serve as a strong reinforcement to the assistance to be provided under PROMESA. The $38 million IBRD-funded PRISA project (Proyecto Reorganización Institucional para el Sector Agrícola), to be signed in 1993, will restructure and modernize the Ministry of Agriculture by focusing on technology transfer, staff organization, and privatization. PRISA efforts to address MAG structural

constraints will be key to improving the effectiveness of MAG agencies in transferring sound natural resource management technologies as envisioned with PROMESA assistance

The IDB is funding a small Institutional Strengthening Project to provide SEMA with limited technical assistance for assessing its organizational structure and, with IICA assistance, for training NGOs in proposal writing The IDB is also designing a $40 million environmental project for 1993 to assist the electric utility, CEL, to manage the upper portion of the Lempa River watershed, and assist SEMA in environmental impact analysis and in the development of a Management Information System. Japanese cofinancing of $30 million will complement the IDB funds in the Rio Lempa project. Also in 1993, the IDB plans to begin strengthening some of the implementing units of the GOES, particularly in environmental impact assessments. In 1994 and 1995, IDB is planning major decontamination projects in industrial waste water, solid waste, and vehicular pollution. PROMESA's focus on "green" issues will be a strong complement to other donor assistance for alleviating and resolving "brown" contamination problems.

The UNDP assisted SEMA in preparing an Environmental Agenda, and financed international training and program observational trips. The UNDP is also providing partial funding and technical assistance for the Forestry Action Plan. The Finnish International Development Agency (FINNIDA) is funding a regional project which provides equipment and materials to rehabilitate the meteorology stations of the MAG Meteorology and Hydrology Service

As described more fully in the next section, PROMESA will play an important catalytic role by strengthening the GOES' capacity to mobilize other donor resources and to manage them effectively.

III. PROJECT DESCRIPTION

A. Problem Statement and Constraints

El Salvador's critical water infrastructure and watershed ecosystems are being damaged by unchecked soil erosion and pollution of surface and underground water. Water sources in rural areas have become less dependable in the dry season; improperly disposed human wastes are polluting even the ground water in some rural locations. Continued damage will render the major water reservoirs useless within 20 years, leading to a shortage of water for hydroelectric generators, agricultural irrigation, and urban consumption. Household energy supplies, especially for the poor, will become increasingly expensive as deforestation continues. Coastal fishing is endangered by the siltation and pollution of the mangroves where commercially important species spawn The damage is caused by improper land use in the upper watersheds, deforestation, improper disposal of human and industrial wastes, and indiscriminate use of agricultural chemicals

The GOES policy framework which guides economic development does not reflect the long term importance of sustainable use of renewable natural resources. These deficient policies promote investment which, although profitable in the near term, causes serious problems over time Both policymakers and ordinary

citizens lack an understanding and appreciation of the link between sustainable natural resource management and economic growth. To date, there has been little clear evidence of the economic and social benefits which derive from sustainable use of natural resources. The absence of this evidence weakens the case for natural resource management, causing it to be conceived as an aethetic or philosphical matter rather than a part of the productive economy

1. Structural Constraints

El Salvador relies on small farmers for basic grain production, but this production often comes at the expense of degrading the land which the farmer plants. Until recently, administered prices for basic grains stifled the farmer's incentive to invest more than the absolute minimum of labor and capital in the farm. Agronomic practices which held soil in place were among the farmer's lowest priorities, since they returned nothing in the short term. With the return to a free market in grains, it is again possible to consider a small farm as a long-term investment which merits conservation. However, the market incentive for a small farmer or woodcutter to invest labor or land for the long run is often less than the pressure to finance immediate needs. The lack of modern agricultural technology, such as improved seed and labor-saving techniques, still leads farmers to choose unsustainable farming practices.

Poverty, illiteracy and poor basic education, population pressure, and insecure land tenure contribute to irrational natural resource management in El Salvador through the reliance of many rural families on unpriced, freely available natural resources. These overarching, long term constraints are outside the scope of direct assistance provided by the Project. However, they can be mitigated by the development activities and the national reconstruction program which the GOES has mobilized, with international donor support, in the post-war period. Still, it will be a generation until the structural constraints begin to ease.

2. Policy and Legal Constraints

With USAID assistance, the MAG and SEMA carried out two policy inventories for natural resources, one in 1990 and a more detailed study in 1992. The inventories highlighted deficiencies in the policy framework. Of greatest importance, El Salvador does not have a national Environmental and Natural Resource Management (ENRM) Strategy. An effective Strategy, arrived at through a broadly-based national consensus, would sort out the responsibilities of each government agency and set objectives and priorities for attacking environmental and natural resource problems. Without an ENRM Strategy, GOES institutions are unable to identify policies with negative environmental consequences or to promote the development and implementation of "win-win" policies which have highly desirable environmental impacts, but with comparatively little economic cost.

Many sectoral laws are contradictory. For example, the GOES prohibits the cutting of mangroves while assessing low stumpage fees, thereby promoting deforestation. Few laws have clear implementing regulations; laws are unevenly applied or not enforced (e g. forestry and fisheries management).

Land use policy, where it does exist and is regulated, often mis-classifies the productive use of sloped land. Because forest land is classified as "idle", agricultural development policy promotes the removal of trees from land which might be suitable for agriculture. Erroneous classifications may encourage production on land which should be left forested.

No current laws or policies address soil fertility according to soil classes; no forest management standards exist; commerce and trading of endangered species is not regulated or enforced and watershed management is not defined. Subsidies to urban water and electricity create a false perception of abundant supply. The true costs of hydroelectric energy should include maintenance of the watersheds that guarantee an even and continuous flow of water, without excess sediment, into the reservoirs. Similarly, shrimp producers receive an unquantified but considerable subsidy by harvesting free larvae from mangrove estuaries, without contributing to the maintenance of the mangroves and estuaries.

No policy delineates institutional management jurisdiction for water The water utility has responsibility for human and industrial consumption, the Ministry of Agriculture regulates water for irrigation, the Ministry of Health is concerned with water-based pathogens, and the electrical utility uses water to generate electricity. Even though each institution is a water user, no entity is responsible for preserving the aquifers and forests of the watershed. This lack of clear-cut oversight responsibility and overlapping, ill-defined jurisdictions threatens the permanent supply of water in El Salvador. A study on water law, commissioned by USAID in 1993 for the Ministry of Planning, is anticipated to highlight the policy and legal constraints.

In addition to immediate budgetary constraints on GOES environmental agencies, long-term planning and implementation have been restricted by insufficient funds Although contributions by the Social Investment Fund (FIS) and the IDB have enabled small NGO and community projects to get underway, funding for specific NRM activities has not been available to NGOs. This constraint will be largely solved with the initiation of funding under FOCAM. A factor which limits resource leveraging by Salvadoran NGOs is the absence of international Private Voluntary Organizations (PVOs) in El Salvador PVOs have not been involved in El Salvador due to the conflict, the late entry of El Salvador into regional and domestic conservation programs, and the mistaken perception of El Salvador as a natural resource wasteland Most such organizations have pledged their resources elsewhere and have little funding available for new initiatives. FOCAM will be an attractive resource for them to enter NRM in El Salvador.

In sum, the policy deficiencies which exist result from the uncoordinated growth of GOES agencies and the low priority which was accorded to environmental and natural resource concerns before and during the war.

3. Lack of Information and Understanding of ENRM Concepts and Techniques

In large measure, environmental degradation and unsustainable use of natural resources take place because most Salvadorans do not appreciate the relationship between economic activity and sustainable resource management. The annual loss of an inch of soil from one field is not easily noticed, but over a large area and a span of years, soil erosion does serious economic

conditionality for the World Bank Second Structural Adjustment Loan is expected to include confirmation of SEMA's role, its institutional location, and budget and staffing stability.

There is a general lack of funding priority for NRM agencies, with operational expense funds largely allocated to salaries. In spite of the fundamental nature of natural resources for agricultural productivity, the GOES assigns low priority to agencies which monitor and protect those resources. The Ministry of Agriculture receives 2 percent of the Ordinary Budget, and directs only 13 percent of its budget allocation to natural resource management. A further problem is the lack of clear responsibility and authority among different agencies charged with managing natural resources.

SEMA's lack of a clearly defined role, its weak institutional capacity, and its location as a unit within the MAG have hampered its development and limited its ability to accomplish its objectives. SEMA's role as the nation's planner, coordinator and monitor of environmental and natural resources policies and initiatives must be strengthened and institutionalized. Without the stature and clout needed to influence the formulation and reform of ENRM policies, and to coordinate GOES, local NGO and international donor NRM activities, SEMA will be unable to fulfill its mandate.

The GOES institutions and NGOs are constrained by the lack of technically skilled staff. Training in off-the-shelf technologies and their transfer and adoption is needed. Techniques for soil conservation, crop treatment and rotation, agroforestry, and sustainable mangrove and forest conservation are but a few of the proven NRM practices which need to be adopted by farmers and other rural inhabitants. The GOES agencies are further inhibited by an inability to monitor the status of key natural resources for policy and regulation, nor do they have the capacity or skills to enforce laws. Municipal governments are similarly unable to enforce compliance with natural resource regulations of their constituents.

Salvadoran NGOs are in the process of establishing themselves as viable entities while implementing uncomplicated programs. They are coordinating technical analyses and small programs in natural restoration, preservation and conservation activities. Others are beginning to use the mass media to increase citizen awareness of environmental problems. Some have fostered national debates on environmental policies through the media and other public fora. Nearly all of these groups are underdeveloped in terms of internal organization and management, fund raising ability and technical skills.

B. Project Goal, Purpose, and End-of-Project Status

The Project Goal is to improve environmental and natural resource management. The Project Purpose is to halt and then reverse degradation of El Salvador's natural resource base to safeguard year-round water supplies and rural incomes.

End-of-Project-Status

At the end of the six-year Project, the Project Purpose will have been attained through achievement of the following three conditions.

1. The GOES will have enacted and implemented key policy reforms in natural resource management, including establishing a source of financial support for NGOs. This will be reflected in the regulatory and juridical framework, the laws themselves, and an enhanced capacity to monitor and enforce the new legislation.

2. There will be an increased level of public support for sustainable management of natural resources. This support will be evidenced among a broad base of Salvadorans, including policy-makers in the Social and Economic Development Committees of the Executive Branch; the Environmental and Health Committee and others in the Legislative Assembly; environmental, health, and agricultural special interest groups, school-aged children; and the population at large.

3 Proven natural resource management practices and methodologies for their transfer will be available for adoption throughout El Salvador. Among others, the practices developed in the demonstration area will serve as a model for local participation in land use decisions, socially acceptable regulatory mechanisms, economically sound incentives, and viable alternatives for local organizational development for the application of sustainable NRM practices.

To achieve the end-of-project status, the Project will finance technical assistance, training, and commodities to help the participating NGOs and GOES entities to accomplish the following eight major outputs:

1a. A National Environmental and Natural Resource Management (ENRM) Strategy will be adopted by the GOES by December 1993 and updated two years later. The implementation of the Strategy will coordinate the various GOES agencies and provide a means of measuring the success of programs in halting and reversing damage to natural resources.

1b Revisions and enactment of laws and regulations applicable to management of the environment and natural resources will be accomplished by 1995. These revisions will include enforcement of existing laws, modernization of selected legislation, and inclusion of environmental clauses into GOES operating documents, such as requiring environmental impact statements for major government investments.

1c. The Government of El Salvador will establish a fund, FOCAM, jointly managed with the private sector, to assist local and international NGOs in carrying out environmental projects and studies.

2a The Ministry of Education (MOE), in coordination with SEMA, will include environmental themes in the public school curriculum for kindergarten through sixth grade by the end of 1996

2b. Two million children and adults (40% of the population) will be more aware of the importance of sustainable natural resource management as a result of public education programs carried out by GOES and private institutions.

3a. Two municipalities and four GOES agencies will become institutionally stronger in management of natural resources This will be demonstrated in technical skills, knowledge and coordination in the implementation of natural resource management practices in the Project Demonstration Area. Practices will include techniques for erosion control, improved water management, sustainable fuelwood and forest products usage, and natural habitat protection.

3b. One or more NGOs in natural resources management will promote continuation of NRM efforts by the NGO community. The Project will support the leading NGOs in natural resources management which emerge at the completion of the SENS Project.

3c Cooperating NGOs and GOES agencies will demonstrate a range of incentive programs and economically viable mechanisms to gain acceptance of sustainable management practices for soil, water, and tree cover

C. Project Strategy

The Environmental Protection Project carries forward with the momentum of GOES efforts in sustainable environmental and natural resources management begun in 1991. Its activities support and deepen the efforts of SEMA to fashion short-term remedies for inappropriate economic use of natural resources while helping to lay the foundation for the longer-term activities of implementing agencies in the MAG and elsewhere. Of special note, the importance of environmental protection enjoys a relatively broad national consensus, including the parties of the political left, reducing ideological obstructions in a variety of topics. El Salvador is catching up with the rest of Central America in protecting its resources. It must reconcile the needs of its relatively dense population with the capacity of its natural resources to supply those needs. The civil war had the effect of minimizing unsustainable exploitation of many fragile natural areas. Now that peace has come, human use of the land is expanding, often in an unsustainable manner

The project will consist of three mutually reinforcing components which deal with policy, education, and demonstration of tangible costs and benefits. The activities in these components cannot be arbitrarily separated -- they feed one another and suggest solutions to problems which appear in related areas. This approach recognizes the holistic and interconnected nature of environmental activities. It enters the circle at points where resistance to change is small and where popular support is relatively great and unwavering. The approach permits the maturing GOES and private implementing agencies to take on responsibility at a measured rate, without being crushed by the weight of the entire sector at once.

The Project emphasizes the development of policies which remove the economic incentives for unsustainable use of environmental and natural resources. Since many natural resource-based products are underpriced (electricity, irrigation water, urban water supply), they are allocated in the economy in an inefficient and unsustainable manner. Project-financed assistance will help GOES agencies and NGOs alike to prepare natural resource policy alternatives for presentation to the new GOES administration to be elected in March 1994. The policy reform process will entail open, national debate on

these alternatives, taking advantage of the consensus in favor of natural resources which exists in spite of political party and ideological differences.

The Project will promote environmental education in schools and in the media to inform the policy dialogue and to motivate it over the long term. The aim will be to provide a significant minority of the population with a basic understanding of ecology and its relation to economic growth. Aimed at both children and adults, an important factor in the educational process is the appreciation of the downstream effects of productive enterprise. Newspaper features on environmental themes, illustrated in color, have been successful in promoting environmental awareness through domestic tourism. Television features have also been successfully used to promote interest in the relationships between the economy and the environment.

Sustainable natural resource use usually involves a trade-off, postponing immediate gain in favor of long-term value. Because the immediate cost is clear, it is imperative that the eventual benefits of sustainable natural resources policies and technologies be clearly shown. Therefore, the Project will assist the GOES to show, in microcosm, the benefits of applying sustainable practices. The demonstration must show the necessary social adaptations as well as the economic and biologic sides of the problem. The Project will help the GOES to provide concrete, measurable results in real-world application of improved natural resource policies and technologies.

Stabilization of soil and water resources is a proposition beyond the scope of a single project. By reducing the policy and financial constraints to improved environmental and natural resource activities, the Project expects to reduce the barriers to other official or private donors which have interest in natural resources projects. The strengthened GOES capacity, together with a more effective Salvadoran NGO community, is also anticipated to facilitate the entry of additional donors. The Project will assist local applicants to FOCAM, so that these Salavadoran NGOs will be able to attract partners in the international PVO community.

Project assistance will thus be used to mitigate the principal constraints which are obstacles to major progress in the natural resources sector As more fully shown in the components below, the GOES and private activities supported by the Environmental Protection Project will be the leading edge of a long-term program to protect the Salvadoran environment and to promote sustainable use of natural resources in the post-war era.

D. Project Components

The three Project components of Policy Formulation and Reform, Demonstration of Benefits, and Environmental Education provide the means and reinforce the will required to stabilize and reverse negative NRM trends Through more effective and enforceable environmental policy and improved education and awareness of environmental concerns, GOES agencies and NGOs will lay the foundations on which sustainable NRM practices can be applied and replicated The Demonstration Area will serve as a laboratory in which NRM practices and incentive mechanisms can be deployed, tested, and in turn, replicated throughout other critical environmental areas of the country. At

the same time a better informed public, and body of legislative decision-makers, will reinforce the enactment and implementation of NRM policies Feedback from the Demonstration Area, training sessions, and the monitoring process will provide validation and refinement of NRM polices and educational messages.

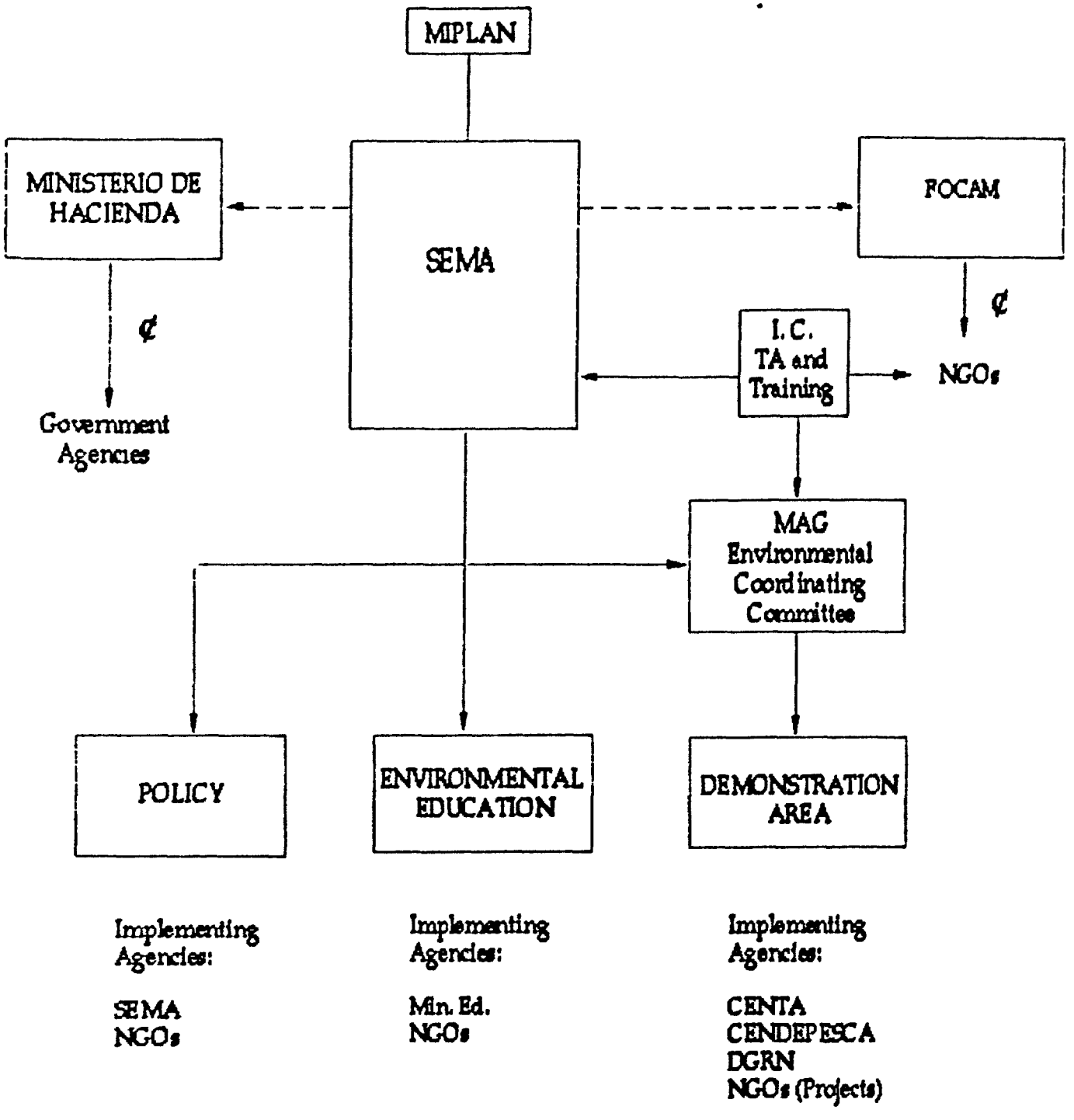
Natural resource management cuts across many GOES and local government agencies and the private sector. A focal point exists in SEMA, which is the project counterpart and will provide overall coordination for the Project. The Project will be implemented by SEMA in its role as planner and coordinator for the sector. The Project will strengthen SEMA's capacity to plan and coordinate activities within the sector, including those of non-GOES entities. SEMA has responsibility to develop and vet policy alternatives, a role which includes the use of NGOs and other agencies to do the work under SEMA's supervison. For environmental education, SEMA will work together with the Ministry of Education for inclusion of environmental topics in basic education curricula and in the adult education programs. At the Ministry of Agriculture, SEMA will collaborate with the Environmental Coordination Committee which represents the three MAG agencies which are most closely associated with natural resources. The MAG has designated a two-person team from its Agricultural Sector Planning Office (OSPA) to assist in monitoring the benefits and achievements of Project-financed activities.

The Project will particularly encourage the active involvement of the NGO community in policy dialogue, formulation of the national ENRM strategy, the demonstration of benefits, and environmental education. NGOs financed under the Project will participate through action plans elaborated by them and approved by SEMA and USAID. Other NGO activities which replicate or expand Project-financed activities will be funded through FOCAM under its established procedures. The Project organizational chart, Figure 2, shows the key implementation elements.

Both GOES and NGO implementing agencies are still developing their capacity to plan and administer complex programs (see Annex D, Institutional Analysis). Coordination among them continues to increase but still depends as much on personalities as systems. They will be assisted in this development by a Project-financed contractors which will advise SEMA and the various institutions. Assistance for policy and for the demonstration area will be obtained through an institutional contractor procured directly under the Project. These personnel will have their offices together with those of SEMA, with the space being part of the GOES counterpart to the Project. Technical assistance in environmental education will be obtained from the centrally contracted GREENCOM project This person will have an office in the Ministry of Education, with the space also counted as GOES counterpart. The contract personnel will be supplemented with assistance from regional USAID projects such as RENARM. SEMA will also coordinate with ongoing USAID-assisted projects such as Strengthening Achievement in Basic Education (SABE).

Linked to the multilateral projects described in Section II.E., the GOES is planning to place SEMA in a strong intersectoral position. There, armed with its National Strategy for Environment and Natural Resource Management, it

PROMESA ORGANIZATIONAL CHART



will be able to influence funding decisions of the Ministry of Finance for GOES agencies involved in NRM and those of international donors. The Strategy will also assist SEMA in guiding and prioritizing FOCAM funding decisions for NGO projects.

Component 1. Policy Reform and Formulation

Policy reform in natural resources management will provide benefits to all Salvadorans through improved use and maintenance of resources, efficient pricing of energy, sustained supply of affordable cooking fuels, and assured year-round availability of water. The reforms will promote substitution of cost-efficient fuels like propane for fuelwood in urban areas and more conveniently available fuelwood supplies in rural areas Water availability will be protected by reforestation and other soil conservation measures which protect against soil erosion and downstream sedimentation. The initial reforms will require two or three years to be fully implemented, with their benefits being gained within the Project life.

SEMA, with assistance provided under this component, will prepare key policy reforms, draft laws and administrative orders, gain their acceptance, and monitor their implementation. These reforms, more thoroughly discussed in Annex C, Technical Analysis, include acceptance of sustainable natural resource management as a cross cutting responsibility of GOES agencies, approval of a national ENRM strategy by CONAMA to carry out this responsibility, changes in the legal codes, changes in the implementing regulations of the law, and judicial procedures which promote compliance with the law. To attain these reforms by the end of 1995 and play a pro-active role in getting the policies in place and enforced, SEMA will receive technical assistance from the Project. GOES staff and other persons will receive training and an aggressive series of seminars and workshops will be financed with Project resources.

SEMA's reform agenda begins with the development of a national Environmental and Natural Resource Management Strategy by December 1993 and is a condition precedent to continued disbursement of Project assistance to SEMA. This document will guide the longer-term policy reform based upon a consensus built by SEMA during its development. The Project will finance 4 person-months of expatriate and 8 person-months of local short term technical assistance to help in the development of the national ENRM strategy. Assistance to SEMA for developing the Strategy will be contracted directly by USAID, since the long-term institutional contractor will not be in place until very late in the process. Submission of the strategy is a condition precedent to the second disbursement of the FY 1993 Policy Reform Program Cash Transfer.

Also in the first year of the Project, SEMA must fully implement the Enterprise for Americas Initiative debt reduction plan, more fully shown in Annex G. On December 15, 1992 the USG forgave $464 million of El Salvador's P1480 and USAID debt. Interest on the remaining $150 million (amounting to $27 million through December 1999) is to be paid in local currency to two EAI accounts in an Environmental Conservation Fund (FOCAM) overseen by a Administrative Council with representatives from the U S. government (the USAID Director), the GOES (Director of SEMA), and NGOs Host country NGOs and scientific and academic organizations can submit proposals to carry out environmental and child survival projects.

SEMA must organize the FOCAM, negotiate an Americas Framework Agreement with the U.S., and see that the EAI accounts within the fund are appropriately structured in time to receive the first interest payments by June, 1993. To speed this process, the Project will fund short-term technical assistance directly procured outside the main contract. The EAI account in FOCAM is anticipated to be able to receive its first proposals from NGOs in late 1993, with the first grants made in early 1994. The Project will finance 4 person-months of expatriate and 8 person-months of local short term technical assistance to help in the structuring of FOCAM's internal regulations. Assistance for developing the Strategy will be contracted directly by USAID, since the long term institutional contractor will not be in place until very late in the process.

During 1994, SEMA will continue to review and analyze the policy framework for environmental and natural resource management. With assistance from the institutional contractor, it will prepare background documentation on policy alternatives in support of reform measures and inform the Legislative Assembly and new GOES policymakers seated in May 1994. The policy reform component will concentrate on the following laws and their implementing regulations:

- The Forestry Law, which regulates forest use and offers incentives for reforestation;

- The Fisheries Law, which regulates the use of estuaries where the young of many ocean species develop;

- The General Water Law and other water use laws, which regulate the industrial, urban, hydroelectric, and irrigation uses of water, as well as the control of pollution;

- The Protected Areas Law, which passes control of selected natural areas from the land reform institute, ISTA, to the DGRN;

Changes in these laws and their implementing regulations will bring them into step with the modern Salvadoran economy and promote the sustainable use of natural resources. These reforms are expected to be completed early in 1996, laying the foundation for further reforms which will be identified during the Project life.

To improve the application of natural resource laws, CENREN and CENDEPESCA will be assisted to have the capacity to train park and forest guards and fishery inspectors, respectively. In the demonstration area, some seminars and training will be arranged for the implementors of environmental laws and regulations, e g. natural resource permit and license givers etc. to ensure fairer and tougher enforcement of the laws. At the same time, CENREN and CENDEPESCA, SEMA, and the Hidro-metereologia division of the Directorate for Natural Resources will be assisted to draw up a natural resources monitoring plan to assess physical progress in applying new NRM policies and practices. The plan and its implementation by SEMA to oversee monitoring of the nation's natural resources will allow SEMA to gauge progress in meeting the National ENRM Strategy goals.

To assist in gaining compliance with natural resource laws, Project assistance will be used to help analyze procedures which are used in the first instance courts for prosecuting abuse of natural resources. Improved court procedures, being developed as part of the USAID-financed Judicial Reform II Project, are anticipated to facilitate the prosecution of unlawful exploitation of protected resources. SEMA will develop guidance for the MAG field staff on the specialized means of defining violations, gathering evidence, and preparing cases to be turned over to the police. No project assistance will be offered, but coordination will be promoted with the two environmental inspectors on the staff of the Procurador General and with the environmental branch of the newly formed National Civilian Police.

In the consensus-building process to facilitate implementation of policy reform, SEMA will foster dialogue among government agencies, legislative leaders, NGOs, the business community, educators, relevant natural resource users, and the population in general. Using Project resources, SEMA will convene an extensive program of seminars for policy makers and legislators, and public workshops to bring NGOs and private business into the process. These events will permit the presentation and discussion of data on environmental problems, as well as the examination of the range of solutions. Participation of agencies from MAG, CEL, ANDA, MIPLAN, Municipalities, and NGOs is expected. Up to 30 seminars and workshops, some of which will include short-term experts financed by the Project, are anticipated in 1994-1995 in support of the initial agenda for reform.

To assist SEMA in gaining acceptance of the reform agenda, the Project will finance up to 40 person-months of short term training outside El Salvador. This training will be offered to GOES and municipal staff and to employees of influential NGOs. Topics will include the economic costs of environmental degradation, structuring and implementation of improved Natural Resource Management, and management of the policy aspects of environment and natural resource issues The Project will also finance up to 10 persons in postgraduate specialties (9 months each) in related areas in order to sustain the momentum of the reform effort.

Once on board, the policy and demonstration area institutional contractor will furnish 65 person-months of long term assistance to SEMA through a chief of party, 36 person months of a policy analyst, and 36 person-months of a logistics and training advisor. These persons will be complemented by a small office staff and a locally hired data management specialist. These persons, supported by up to 33 person-months of expatriate and 92 person-months of local short term technical assistance, will also manage the training activities for the policy component.

Component 2. Demonstration of Benefits

Project activities in the Demonstration Area will be overseen by the MAG Environmental Coordinating Committee composed of CENTA, DGNR, and CENDEPESCA and answering directly to the Minister's office. Its activities will be managed by a Coordinator, a MAG staff member who will be the point of contact between SEMA and the working level agencies of the Ministry of Agriculture. As part of implementing the national ENRM Strategy, activities in the Demonstration Area will include strengthening the field operations of three

MAG natural resource units, two national NGOs with activities in the area, and two municipal governments with justices of the peace. These actors, beginning in 1994, will be involved in a 42-month process to show in practice the "how" and "why" of sustainable natural resource management.

The Coordinator will direct the field staff of MAG agencies, assisted by Peace Corps Volunteers and contract personnel. The institutional contractor will establish a field office in Guayapa in the center of the DA, where a long term NRM advisor will supervise the contractor's activities in the demonstration area. A long term local hire office chief and logistical person will assist the contractor's short term expatriate and local technical assistance personnel Local hire technical assistance in environmental education (funded under Component 3) will operate an environmental education program in the area. Assistance may also be provided from the RENARM project in agroforestry and buffer zone management.

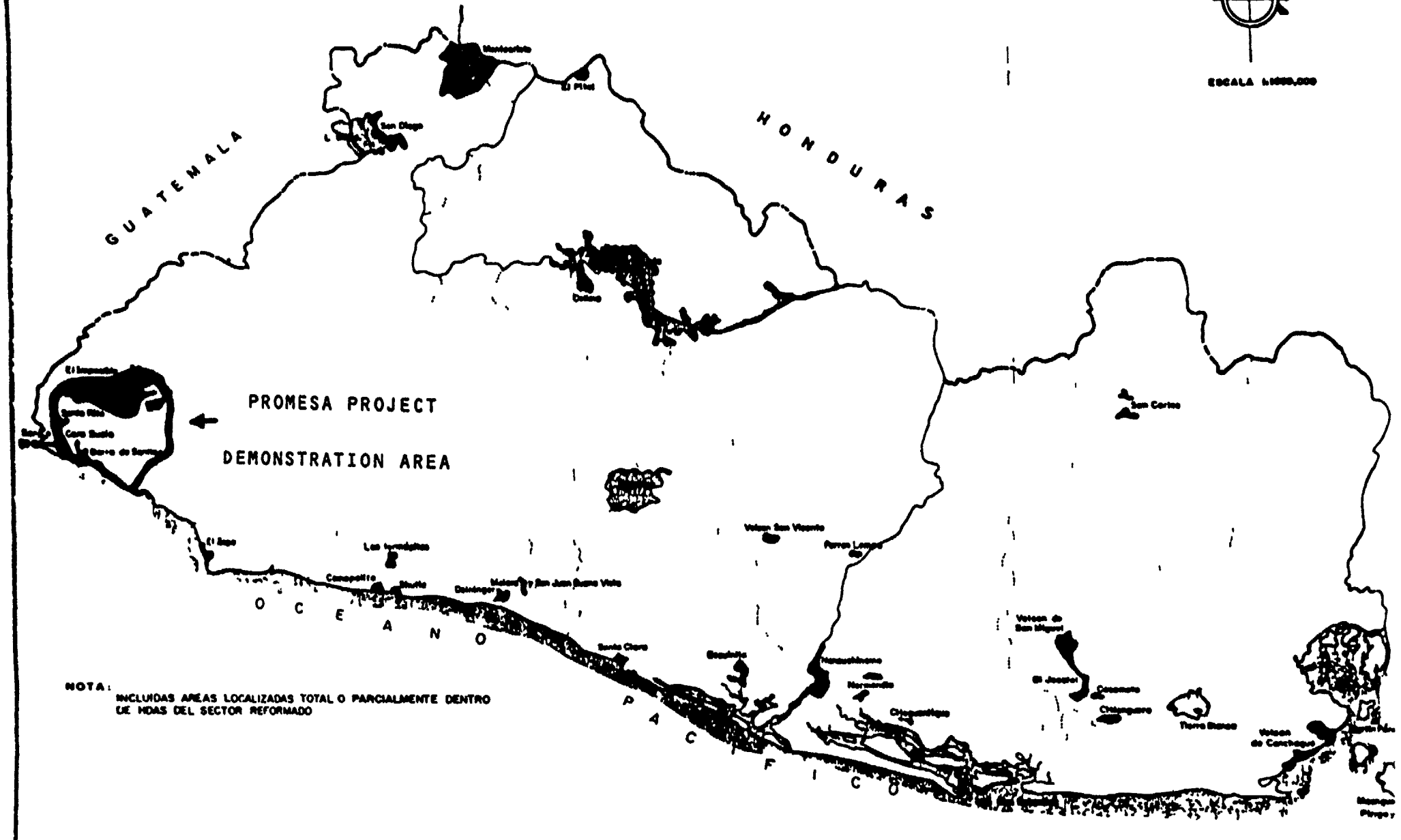
The results of natural resource management are often difficult to show in the near-term and the Economic Analysis, Annex F, notes that NRM activities do not fit the commonly used cost/benefit analysis. To enable benefits of the Project to be quantified on the ground, a field demonstration area (DA) will be established where the effects of policy reform, environmental education, and improved conservation practices can be more easily measured. The area selected (see maps) is a 30,000 ha. transect in Ahuachapán department from the El Imposible National Park downstream to the Barra de Santiago mangrove estuary. Between these two protected areas lies a representative mix of five agrarian reform cooperatives, 8,000 independent small farmers, two rural market towns, and a major highway.

In the demonstration of tangible benefits of natural resource management techniques, Project-assisted activities will directly affect 2,000 small farm families (10,000 people) who live in the demonstration area. These families will establish improved practices on 4,000 ha. of cropland, in addition to at least 1,100 ha. on agrarian reform cooperatives and 1,000 ha in managed buffer zones around the two protected areas The short term benefit they receive will be reduced labor for wood gathering and water carrying as well as increased income security from crop diversification. In the longer term, their farms will retain the productivity of the soil due to reduced erosion and use of sustainable agronomic practices. Women comprise the principal rural labor resource which can add to family income and increase living standards. Time freed when it is no longer required to collect wood or carry water can be used for microenterprise or paid agricultural field or processing labor.

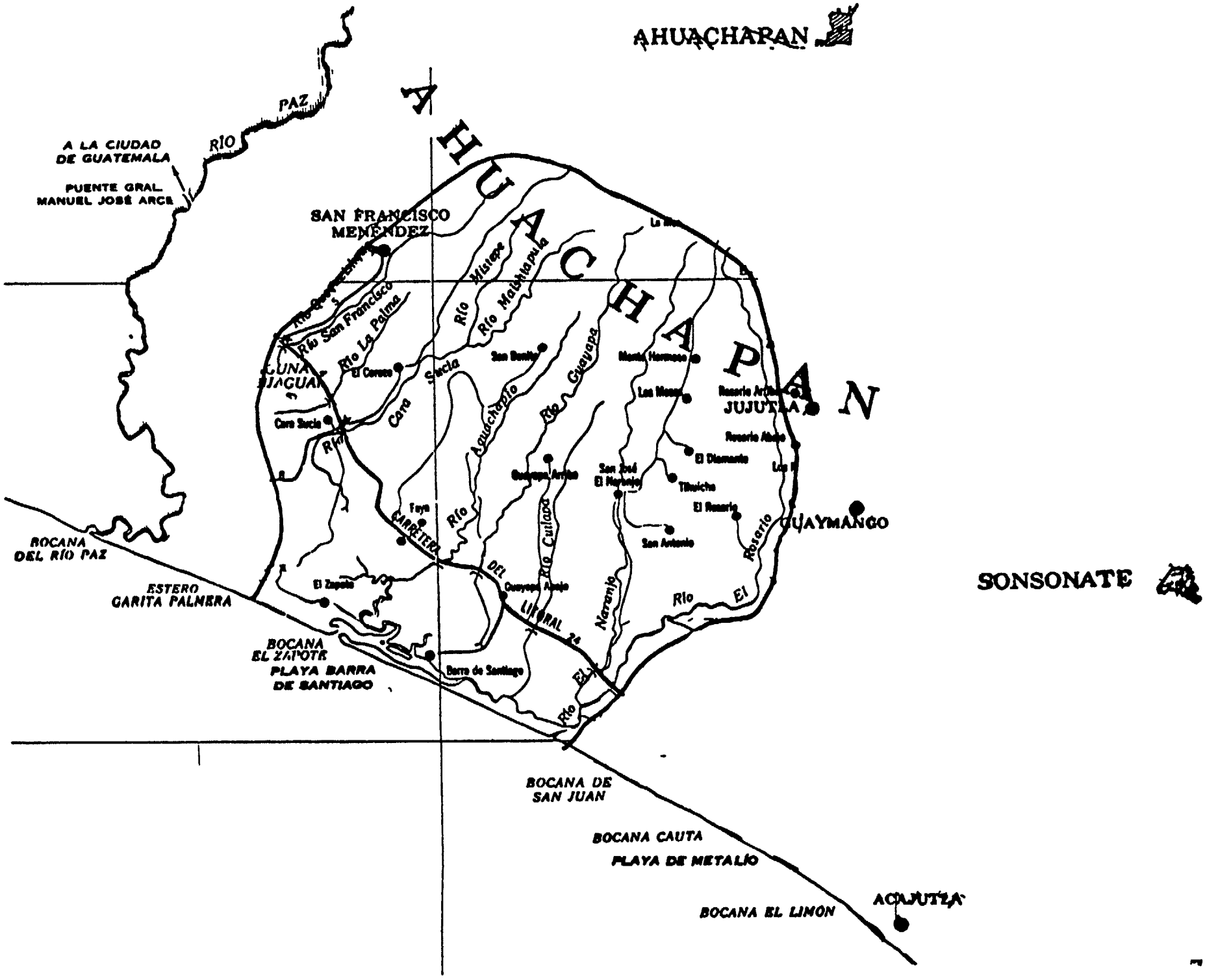
Another 10,000 small farmers are expected to benefit if the anticipated replication of the techniques occurs nationwide as planned. The influence of the replication is anticipated to be felt on 20,000 ha of small farms and 5,000 ha of agrarian reform cooperatives nationwide. Direct replication of DA activities will be planned for by Project participants in two additional areas in the eastern part of the country, watersheds emptying into the

MAPA Nº 10

LOCALIZACION DE AREAS NATURALES A RESERVAR



NOTA: INCLUIDAS AREAS LOCALIZADAS TOTAL O PARCIALMENTE DENTRO DE HDAS DEL SECTOR REFORMADO


AHUACHAPAN
AHUACHARAN
SONSONATE
ACAJUTLA
A LA CIUDAD DE GUATEMALA
PUENTE GRAL. MANUEL JOSÉ ARCE
RÍO PAZ
SAN FRANCISCO MENÉNDEZ
Río San Francisco
Río La Palma
Río Mistepe
Río Malhuapula
Río Guayapa
Río Cutiapa
Río Naranjo
Río El Rosario
Río El
Río Sucia
Río Cara
Río Aguachapio
CARRETERA DEL LITORAL
JUJUTLA
GUAYMANGO
El Diamante
Tihuiche
El Rosario
San Antonio
Faya
El Zapote
Barra de Santiago
BOCANA DEL RÍO PAZ
ESTERO GARITA PALMERA
BOCANA EL ZAPOTE
PLAYA BARRA DE SANTIAGO
BOCANA DE SAN JUAN
BOCANA CAUTA
PLAYA DE METALÍO
BOCANA EL LIMON

Jaltepeque and Jiquilisco estuaries. These areas could then be managed by Salvadoran NGOs in partnership with international PVOs using EAI/FOCAM funds.

A number of design studies were carried out to assist in planning the Project which will be useful in implementation as well. In 1991, the MAG undertook a water quality study with USAID assistance to determine the extent and types of pollution in the demonstration area Further data on the area was obtained in a 1991 analysis of options for extending NRM practices to farmers carried out by LACTECH. The programmatic Environmental Assessment required for the Project (see Annex B) provided data and implementation guidance. MAG also received USAID assistance in preparation of a 1992 nationwide study of fuelwood use which offers recommendations for increasing fuelwood supply and decreasing demand for it.

Locally hired project staff will begin work with the local representatives of CENTA, DGNR, CENDEPESCA, the municipalities of Jujutla and San Francisco Menéndez, Peace Corps Volunteers, and local NGOs. The GOES agencies are the principal authorities and opinion leaders which monitor and promote compliance with natural resource regulations. The Project-financed staff will assist them in carrying out a Participatory Rural Appraisal of the zone to determine local needs and priorities. The GOES agency staff will also undertake a detailed baseline survey of natural resources in the area. These activities will collect information in greater detail, dealing with small groups and individual farmers, than was needed for the Project design. The studies can best be undertaken before the rains begin, when travel is easiest and farmers are less busy with cultivation. To ensure mobility of personnel in the Demonstration Area, the Contractor will procure up to 30 small motorcycles for the staff of participating agencies over the Project life. These motorcycles will continue to be administered by the Contractor during the Project life.

In the first planting season, in May 1994, the GOES and other agency staff will locate up to 200 sites of one hectare each where improved management techniques including commercial woodlots will be demonstrated. Many will be hillside plots where corn and beans or sorghum are grown. In these agricultural sites, techniques might include absorption ditches, fish-scale terraces, contour planting, mixed grain and tree cropping, and homestead woodlots. The management sites will be used to show other farmers how the short term cost of NRM practices are linked clearly to later benefits. Farmers who installed original demonstration plots will become action agents to work with other farmers thus multiplying the impact of the Project.

Direct contact with the residents of the Demonstration Area will be through eight CENTA extension agents, ten park and forest guards, and two fisheries inspectors These persons, resident in the Area, are the most important part of the Component. They and other such first level personnel across El Salvador have the responsibility for developing awareness in individual farmers of soil and water management problems and convincing them to adopt NRM practices. The technology transfer techniques which the agents will use are the basis for successful replication of NRM practices over a larger geographic area. Thus, while the individual farmer or fisherman is the person who ultimately controls the success or failure of NRM practices, the extension agents, guards, and inspectors are the means of reaching farmers and fishermen in a cost-effective manner.

The Project will select sites for community nurseries which will be the source of fuelwood and multiple use trees for distribution to participating households. Adoption of NRM practices may cause farmers to remove some of their cropland from basic grain production and put it to another use with a longer term return. To compensate for the short term income foregone in order to utilize NRM techniques, the Project will finance an incentive package during each farmer's first year of participation. The design of the incentive package will be part of the design of the recruitment process for participants.

These incentives could include provision of improved basic grain seed capable of better yields, fertilizer, more efficient cook stoves, etc. Provision of young trees and materials to build soil conservation structures is possible. Other possible incentives, which depend on negotiation during the project life, could include partial forgiveness of agrarian debt, grain processing or storage facilities, or specialized technical assistance. In the buffer zones around the two protected areas, techniques might include sustainable harvesting of fuelwood, planting of tree crops, and minimum impact use of wildlife habitats. Similarly, soil conservation and agroforestry techniques will be offered to agrarian reform cooperatives in the area who are already working with two USAID-financed crop diversification and agribusiness projects which receive assistance from CLUSA and TECHNOSERVE.

Also during the first year of the Project, the MAG Environmental Coordinating Committee and SEMA with the contractor's help, will design and implement a monitoring system to indicate progress against selected NRM indicators. These include potable water quality, sediment loads, compliance with hunting, fishing and timber extraction limits, economic effect of the NRM interventions, etc.

This monitoring system, discussed more fully in Section IV.D., will help inform the policy reform process under Component One and the two Project evaluations. Up to 12 person-months of expatriate and 48 person-months of local short term assistance will be financed to design and maintain the monitoring system which will later enable the GOES to evaluate changes in the status of the country's natural resources. The Project may procure aerial photography or commercially available satellite images if they are necessary to the monitoring effort.

The Project will finance a long term specialist under the policy and demonstration institutional contractor to oversee participant training in the Policy Component as well as other training activities in the demonstration area. Selected participants in all components, plus interested governmental and NGO personnel, will attend seminars in the demonstration area in order to have hands-on experience in the social as well as the technical complexity of NRM activities.

In subsequent years, additional demonstration sites will be established in the demonstration area until a total of 2000 small sites and sites on all 5 cooperatives have been undertaken. This represents more than 20% of farmers in the area, enough to clearly demonstrate the value of the new techniques. The incentives for initial participation will continue, with modifications as needed within the $200 budget per incentive. Extension agents and others will be cycled through the field seminars as second and third year results are available.

In 1995, after the Environmental NGO Strengthening Project is completed, the Project will assist one or two well qualified local NGOs to participate with the MAG Coordinating Committee in supervising the transfer and implementation of natural resource management techniques in the demonstration area. In addition to the two expatriate and one local long term position, up to 40 person-months of expatriate and 128 person-months of local short term assistance will be financed to provide timely assistance on all technical matters in the DA such as specialized crop information, agroforestry and soil conservation techniques, mangrove management technology, and micro-enterprise opportunities in the estuary. The contractor will also manage the procurement of vehicles, boats, and maintenance for the field office.

In order to ensure the most rapid field training possible, the Project will finance up to 52 person-months of short term training abroad for personnel of the GOES agencies and NGOs. Project-funded Associates will visit other neighboring Central American countries to see how NRM technologies have been implemented and to understand how problems transfering these technologies were overcome.

In 1995 and later years, GOES agencies and local NGOs will be solicited for the replication of the techniques demonstrated under the Project in other parts of El Salvador. The replication may be financed under grants from FOCAM, if undertaken by NGOs, with joint proposals with international community development and environmental PVOs encouraged. Up to 6 person-months of expatriate and 12 person-months of local short term assistance will be financed to assist local NGOs in the preparation of such proposals.

Component 3: Environmental Education

Environmental education assisted by the Project is expected to directly reach 725,000 schoolchildren in grades K-6, inform two million persons by mass media about environmental themes, deliver conservation messages to 300,000 visitors to interpretation centers, and train 640 extension agents in natural resource management techniques. The benefit derived from such education will be a heightened awareness of the value of the environment and natural resources, leading to broad-based support for policy reform and implementation of natural resource management laws. The full benefit of environmental education extends beyond the end of the Project, as citizens continue to demand that public policy and private investment comply with sustainable use of natural resources.

SEMA, with USAID assistance, assessed environmental education in 1992. The results confirmed that a variety of educational means was desirable and that the acceptance of environmental education was relatively high. A poll taken in January 1993 by USAID will be used to establish baseline data for knowledge, attitudes, and practices in environmental education.

SEMA, with further assistance under this component, will coordinate (but not control) environmental education with a national environmental education plan and a variety of means. The most formal is the public school curriculum for kindergarten through sixth grade, which reaches 81% of all children who are enrolled in a public school. Informal education involves the development of interpretive materials at parks and protected areas, which can be done by GOES

agencies, municipalities, and NGOs. Mass media will also be used to reach adults and those not in school. Women are well placed to reinforce the environmental education which their children receive and are also heavily involved in community sharing of information. It is important that environmental messages be relevant and accessible to women as well as men. SEMA also will coordinate with CENTA the natural resources training of 640 extension agents in 80 agencies who can spread sustainable management techniques throughout the nation.

The Project will finance, through a buy-in contribution to the GREENCOM Project, two years of intensive assistance to environmental education. An education advisor will help the Ministry of Education, the Forest and Park Services, NGOs, and the agricultural extension service in implementing a variety of environmental education activities. The advisor will also assist SEMA and the MOE to implement the national environmental education plan that will coordinate increasingly complex environmental and natural resource messages that reinforce each other through the formal, informal, and non-formal elements of the plan. National awareness campaigns and the coordination of public relations outreach through the media will be important tools to assist in implementing the plan.

In the primary school curriculum, the MOE, in concert with the on-going SABE curriculum revision project, will use Project assistance to incorporate environmental themes into all levels and subjects. While a specific "environment" class is not expected, science and social studies can include units on the environment and how people's lives affect it for good or ill.

The medium for presentation of environmental topics could be supplements to text books, or a series of short units interspersed with the text book lessons. Participative techniques such as field trips and personal activities like making collections or small projects will also be promoted. Short-term technical assistance will be used to supplement MOE staff capacity. Experience under the RENARM Project may be useful in this area because of the extensive work already undertaken by the PACA project in other Central American countries.

For persons no longer in school, the Project will assist the Forest and Park Services (and possibly the national tourism institute, ISTU) to develop interpretive sites in protected areas and with NGOs to develop mass media campaigns. Assistance will include design of tourist infrastructure and messages concerning the importance of protected areas to the environment. NGOs will be assisted to design print and visual material for use by their groups and in mass media, with emphasis on the importance of sustainable natural resource management Assistance will also be provided in packaging the messages in ways which maximize free media coverage, such as feature articles and participation in newsworthy events. A series of seminars will be financed to teach GOES and NGO personnel the essentials of these tasks, with short-term technical assistance made available in selected specialties Assistance will also be provided to local NGOs for a variety of community-based environmental education and communication activities.

CENTA will be assisted to achieve the capacity to train agricultural extension agents in agroforestry and soil conservation techniques through in-service

workshops and visits to the Demonstration Area. These agents are in direct contact with farmers and thus can be the most cost-effective means of teaching them the importance of soil conservation and agroforestry. Up to 120 agents will be trained annually in a series of 43 workshops supported by short-term technical assistance. Additional training will be provided to extension supervisors to ensure that field activities of agents are properly monitored.

To support the environmental education effort, the Project will finance up to 50 person-months of short term training in development of environmental education techniques. Long term training abroad will be financed for eight persons (up to 72 person-months) for post-graduate specialization in environmental education.

The GREENCOM contractor will provide 36 person-months of a long term environmental education advisor and up to 66 person-months of expatriate and 136 person-months of local specialized short term assistance for mass media programs and interpretation programs. The education advisor will supervise the in-country program as well as the selection of persons to be trained outside El Salvador.

IV. IMPLEMENTATION ARRANGEMENTS

A. Instruments and Agencies

The Project will be obligated by means of a Handbook 3 bilateral grant agreement signed with the Minister of Planning as GOES legal representative with the participation of the Ministry of Agriculture, who oversees the Project implementing agency, the Executive Secretariat for the Environment.

SEMA, as the GOES coordinator for environmental matters, will deepen that role under the Project. Its staff will be responsible for the development and submission of annual action plans to USAID for Project-financed activities. It will proactively seek consensus in the evolving policy dialogue among the GOES and private agencies. Similarly, SEMA staff will harmonize the environmental education program in the primary schools with the informal programs undertaken by the agencies of the MAG Environmental Coordinating Committee (ECC) and the participating NGO's. The ECC will implement the demonstration of benefits under Component 3 through its constituent agencies as part of the national ENRM strategy authored by SEMA. In carrying out its planning and coordination role, SEMA will be supported by an Institutional Contractor selected by USAID and the Ministry of Agriculture under full and open competition.

For Project start-up and management, USAID will directly contract a PSC Project Manager, special project studies, and the evaluations and audits

B. Management and Coordination

Mission coordination of the Project and the institutional and GREENCOM contractors will be overseen by a USDH Officer, with day-to-day management responsibility carried out by a US PSC Project Manager. A Project

FY 93-97 USAID/El Salvador Program Objectives Document. By September 1993, the institutional technical assistance contractor will have helped the SEMA to establish a monitoring plan which includes baseline data, targets, frequency of planned measurement, source and responsible office for each indicator and output. Cooperation with the MAG sectoral moninitoring team and with the Finnish project to strengthen the Meteorological Service will also enhance monitoring of the Project. While information collected should be accessible at all times, two reporting requirements are paramount - the Mission's Semi-annual Report and the annual Action Plan.

In order to measure changes in attitudes and behavior during the Project, the education component will use the results of a January 1993 national poll of opinions and practices concerning natural resources. The initial poll will be complemented by surveys of focus groups representing public opinion and institutional sectors of special interest to NGOs and policy makers. This baseline information is supplemented by an inventory of environmental organizations completed in 1992. These surveys and studies will be repeated in 1995 and 1998 to provide a basis for collaboration between SEMA and NGOs active in natural resource education, and a means for adjusting program activities as the Project evolves.

Understanding and addressing the roles and activities of both women and men will be important to achieving project objectives, especially in the demonstration of benefits. Women are the primary collectors and users of fuelwood and water for domestic purposes, their full participation in decisions concerning these resources will be needed to ensure a sustained change in use of these resources. Women are involved in nearly all agricultural activities on family farms, the labor, the cultivation practices, and the planting decisions. In addition to the extant rate of woman heads of households, women are increasingly being left in charge of family farms as the men migrate to the cities in search of wage labor. Baseline data will be collected on women's activities and attitudes as well as men's.

Two formal evaluations are scheduled - a midterm evaluation (October 1995) at the end of the second full year of project activities and a final evaluation (October 1998) prior to the PACD. Both will be performed by an independent evaluator who will review the data available from the technical assistance contractor's monitoring plan, the participating ENRM sector institutions, and other appropriate sources in order to confirm the validity of the information collected during the Project. The midterm evaluation will focus on overall implementation of the project and progress towards meeting stated goal, purpose, results. The evaluators will recommend corrective actions needed in the remaining life-of-project. The evaluator will also consider whether the attribution of Project benefits to Project assistance is appropriately done. The final evaluation will be most concerned with a determination of natural resource management success in protecting year round water supply and rural incomes

F. Summary Training Plan

Project-funded training will include sending associates to short courses in Central and South American countries and the U.S., up to 130 person-months total. Observational travel for the benefit of associates in the GOES and

Table 3. El Salvador. Environmental Protection Project
Benchmarks for Project Progress

	Technical Progress	Management/Conditionality
March 31		- Initial Obligation
April		- MOU signed between SEMA and MOE for environmental education assistance (Project conditionality) - Establishment of an environmental coordination committee within MAG (Project conditionality)
May	- Priority TA begins for FOCAM EAI Fund	- Project Agreement ratified by Legislative Assembly - RFP published for policy and demonstration area technical assistance contractor - Americas Framework Agreement submitted to Assembly (FOCAM)
June		- Delivery Order for work under GREENCOM signed
July		- Policy and demonstration area assistance proposals received
August	- Development begins for the National Environmental Education Plan	- Environmental education advisor arrives in El Salvador (24 pm) - Policy and demonstration area technical assistance contract awarded
September		- CONAMA presented with alternatives for relocating SEMA to multi-sectoral position with secure staffing and budget (IBRD conditionality)
October	- Detailed baseline for Demo Area begins - Monitoring system design begins - Planning in demo area begins - JCC Policy Advisor arrives	- Policy and demonstration area technical assistance team arrives in El Salvador - MAG commitment for demo area resources (Project conditionality)

Table 3. El Salvador. Environmental Protection Project Benchmarks for Project Progress, Continued

December	- National Environmental Education plan complete	- National Natural Resources Strategy completed (ESF and Project conditionality)
January 94	- National NRM strategy implementation begins - FOCAM EAI fund operational	
February	- Monitoring system complete - Demonstration area implementation begins - 9 LT participants selected (July departure)	
September	- National ENRM Strategy implementation completed - Replication planning begins	
February 95	- 9 LT participants selected (July departure) - NGOs from SENS enter PROMESA	
September	- 400 farmers and 2 co-ops participating in demo area - Next round of policy reform being planned by SEMA - Project-financed environmental education fully taken over by MOE and NGOs - EE advisor departs	- Mid term Evaluation
September 96	- First round of policy reform complete. Second round begins - 800 farmers and 3 co-ops participating in demo area - Policy JCC advisor departs - Training Specialist departs	
September 97	- 1,200 farmers and 4 co-ops participating in demo area	
September 98	- Second round policy reform completed - 1,600 farmers and 5 co-ops participating in demo area	- Final Evaluation - PACR preparation
January 99		PACD

Salvadoran NGOs, up to 12 person-months, is also planned. To strengthen the technical leadership in natural resources management, a further 18 fellows will be sent for post-graduate specialization in natural resources management areas, for a total of 162 person-months. All training will be funded through one of the two contractors, using unfunded PIO/Ps in accordance with prevailing USAID regulations. Training plans will be included in the annual Action Plan submitted by the contractors.

Personnel selected for training and the kinds of training which will be funded by the Project will be determined on the basis of a training needs assessment. This assessment, undertaken by SEMA and the institutional contractor, will be approved by USAID prior to the selection of the 1994 group of associates and fellows. Table 3 shows the plan for training personnel under the project. Annex J contains details of training by component.

Table 4. El Salvador. Environmental Protection Project
Schedule for Participant Training

Action	1994 Fellows	1995 Fellows	1994 Assoc.	1995 Assoc.	1996 Assoc.
Participant Nomination	2/94	2/95	2/94	10/94	10/95
Background Check	2/94	2/95	2/94	10/94	10/95
PIO/P processed	3/94	3/95	3/94	11/94	11/95
Enrollment Completed	8/94	8/95	5/94	1/95	1/96
Departure	9/94	9/95	varies	varies	varies
Return	varies	varies	varies	varies	varies

G. Negotiating Status, Conditions Precedent, and Covenants

1. Negotiating Status

Mission staff has met with the Minister of Planning, the Director of SEMA, the Minister of Agriculture, and the chiefs of MAG environmental agencies: the Agriculture Technology Center (CENTA), the Directorate of Natural Resources (DGNR), and the Fisheries Development Center (CENDEPESCA). These officials gave their views on the constraints which the Project should address and their plans and proposed options to solve these constraints These views have been incorporated into the design. A variety of local NGOs were assessed and their opinions included in the project design. Several international environmental PVOs were also queried as to their interest in the project design and opinion as to its priority and viability.

2. ESF Conditionality

The Mission will use conditionality contained in the FY 93 Policy Reform Cash Transfer Program to reinforce the conditions carried in the Project Agreement. These reforms are formally monitored as part of the Policy Reform Program but are shown in the Project implementation plan for coordination purposes For the first disbursement, programmed for June 1993, the GOES will formulate a plan for improving the quality of the environment, including the steps required to develop a National Environmental and Natural Resources Strategy. For the second disbursement, programmed for October 1993, the GOES will have demonstrated satisfactory progress in implementation and financing of the plan, including the approval of a National ENRM Strategy.

3. Project Conditionality

The standard Conditions Precedent to disbursement apply, regarding the provision of a legal opinion to USAID that the Project Agreement has been properly executed and that its terms are valid for undertakings of the Government of El Salvador. In addition, the following Conditions Precedent will be included in the Project Agreement:

a. Environmental Coordination

Prior to issuing the RFP for contracting the Institutional Contractor, the Mission will receive from the GOES evidence satisfactory to USAID that the Ministry of Agriculture has established an Environmental Coordinating Committee among the MAG environmental implementing agencies. The condition is expected to be met by April 1993.

b. MOU for Environmental Education

Prior to issuing the RFP for contracting the Institutional Contractor, the GOES will provide evidence satisfactory to USAID that a Memorandum of Understanding has been signed between SEMA and the Ministry of Education which will incorporate environmental education into the K-6 curriculum, and that adequate physical and financial resources, as detailed in Table 11, are pledged for participation in the Project by the Ministry of Education. This condition is expected to be met by March 1993.

c. National ENRM Strategy

Prior to disbursement for short term technical assistance beyond December 1993 to SEMA for the policy reform, the GOES will provide evidence satisfactory to USAID that CONAMA has submitted a national Environmental and Natural Resources Management Strategy which will guide the policy reforms promoted by SEMA during 1994 and 1995. This condition also appears in the Policy Reform Cash Transfer Program, and is expected to be met by October 1993.

d. MOU for MAG Personnel and Resources

Prior to disbursement for technical assistance to the members of the MAG Environmental Coordinating Committee in the Demonstration Area, the GOES will provide evidence satisfactory to USAID that a Memorandum of Understanding has

been signed between MIPLAN and Ministry of Agriculture, through its Environmental Coordinating Committee, which ensures an adequate number of extensionist and regulatory personnel will be available in the project Demonstration Area, and that adequate physical and financial resources, as detailled in Table 11, are pledged for participation in the Project by CENTA, DGNR and CENDEPESCA during the life-of-project. The Memorandum will also define the role of the monitoring team from MAG's Agricultural Sector Planning Office. This condition is expected to be met by October 1993.

e. Institutional Arrangements for SEMA

Prior to disbursement for technical assistance to SEMA for any purpose after December 1993, the GOES will provide evidence satisfactory to USAID that SEMA has been located in an institution which permits it to successfully plan, coordinate, and monitor a multisectoral environmental and natural resource strategy. This condition is expected to be met by August 1993.

4. Covenants

The Project Agreement with the GOES will contain general covenants to the effect that the GOES will make good faith efforts to correct implementation problems identified during the Project reviews or evaluations and to implement recommendations arising from the work being performed under the Project. The GOES will covenant to make its best efforts during the consolidation of the Ordinary and Extraordinary Budgets to provide counterpart funding, including local currency generations from the USDA-administered PL-480 Title I program. The GOES will also covenant to provide in kind, the vehicles, NRM implementation equipment and office resources, public training facilities and urban interpretation sites for utilization as required under the Project.

H. Waivers

1. Source and Origin for Training

The Project will include a blanket waiver for training outside of the United States in Central America and other countries of the hemisphere. The non-U.S. source training is estimated at $250,000 over the life of the Project. The most likely sites for such non-U S. training are INCAE and CATIE in Costa Rica and the Zamorano agricultural school in Honduras. These three region-based programs provide excellent settings in which the PROMESA Project participants can observe the conservation and economic benefits of effective NRM practices through specialized short term or postgraduate training programs. The Project Authorization will include a waiver for the purpose of funding the proposed non-U S training

2. Source and Origin Waiver for Technical Assistance

A copy of the waiver of source and origin for GEF-related procurement is shown in Annex M. Technical assistance under the institutional contractor will be related in part to GEF, and will therefore be competitively procured from Geographic Code 935, Special Free World.

SOURCE SELECTION INFORMATION

V. FINANCIAL, AUDIT, AND PROCUREMENT PLAN

A. Financial Management, Accountability, and Audit Plan

The Project is a $20 million, Handbook 3 bilateral grant to the Government of El Salvador. The Project will be coordinated by SEMA, with the assistance of two contractors. The contractor for policy and demonstration area assistance will be selected through full and open competition. Technical assistance for environmental education will be provided by a buy-in contribution to the GREENCOM project, 536-5839.

The six-year Project (FY93-FY99) supports Policy Formulation and Reform, Environmental Education, and Demonstration Activities. Tables 5-9 show the financial plan by component. Table 10 contains a projection of the cash flow by fiscal year ending in FY '99. Table 11 shows the Project financial plan by input, divided between U S. dollar and local currency costs in dollar equivalents. Table 12 identifies the method of implementation and financing that will be used for the life-of-Project.

Project counterpart funds will total $7 million, or 26 percent of the total $27 million Project cost. Counterpart is provided by SEMA; the GOES environmental agencies of CENTA, CENDEPESCA, and DGNR; the Ministry of Education; FOCAM, through the GOES allocation of EAI debt forgiveness interest payments; and local environmental NGOs and municipalities participating in the Project, including donations of media coverage on environmental topics. Contributions will be provided primarily in personnel, logistical, administrative and technical resources, grant funding, and in-kind support derived from existing infrastructure and other sunk costs that can be applied directly to project component activities.

Selection criteria for the policy and demonstration area contractor will require financial management standards and demonstrated capability to comply with USAID technical, administrative, financial, accounting, and internal control standards The GREENCOM Project will ascertain the capability of the environmental education contractor prior to execution of the Mission's delivery order.

Direct payment, a preferred disbursement method under the payment verification policy, will be used to reimburse the institutional contractor for eligible project costs. Payments will be made to the contractor upon submission of duly executed invoices, approved by the USDH project manager in accordance with the procedures prescribed in the payment verification policy.

<u>Audit</u> No audit funds are required to be budgeted under this grant agreement given that no funds will be given to the GOES implementing entities and that audits for the U S contractor; are subject to FAR 52.215-2 and are paid by A I D.'s Inspector General per the contract with the U S entities.

Table 5. El Salvador. Environmental Protection Project Component Budget for Policy Reform: USAID Contribution ($000) (Policy and Demonstration Area Contractor)

		FX	LC	Total
LT Chief of Party	65 pm	2,500	-	2,500
LT Policy Advisor	36 pm	1,000	-	1,000
LT Training/Procurement Advisor	36 pm	800	-	800
LT local data management specialist	65 pm	-	350	350
U.S. ST Advisors	30 pm	625	-	625
Local ST Advisors	92 pm	-	380	380
Local Office Support	65 mo	-	750	750
Seminars and Workshops	30	-	250	250
Commodities		85	45	130
Vehicles	2	(45)	(0)	
Spares and Fuel	-	(0)	(45)	
Office Equipment	-	(40)	(0)	
LT Training	90 pm	100	-	100
ST Training	40 pm	115	-	115
Total for Policy Reform		5,225	1,775	7,200

Table 6. El Salvador. Environmental Protection Project Component Budget for Demonstration Area: USAID Contribution ($000) (Policy and Demonstration Area Contractor)

		FX	LC	Total
Natural Resources Mgmt Advisor	65 pm	1,865	-	1,865
LT Local Logistics Technician	36 pm	-	206	206
Field Office staff		-	422	422
U S. ST Assistance	40 pm	977	-	977
Local ST Assistance	128 pm	-	734	734
Seminars and Workshops	24	-	106	106
Monitoring - US ST Assistance	12 pm	294	-	294
Monitoring - Local ST Assistance	28 pm	-	278	278
Replication - US ST Assistance	6 pm	147	-	147
Replication - Local ST Assistance	39 pm	-	239	239
Local NGO Subcontracts		-	330	330
Commodities		380	652	1,032
Vehicles	7	(159)	-	
Spares and Fuel		-	(187)	
Motorcycles	30	(34)	-	
Motorboat	2	(6)	-	
Photos & Images		(141)		
Office Equipment		(40)	-	
Participation Incentives			(465)	
ST Training	52 pm	170	-	170
Total for Demonstration of Benefits		3,833	2,947	6,800

SOURCE SELECTION INFORMATION

Table 7. El Salvador. Environmental Protection Project
Component Budget for Environmental Education
(GREENCOM Buy-in)
USAID Contribution
($000)

		FX	LC	Total
LT Environmental Education Advisor	36 pm	915	-	915
U.S. ST Assistance	66 pm	1,636	-	1,636
Local ST Assistance	136 pm	-	774	774
Seminars and Workshops	43	-	356	356
Commodities		61	20	81
Vehicle	1	(21)	(-)	
Spares and Fuel		(-)	(20)	
Office Equipment		(40)	(-)	
LT Training	72 pm	98	-	98
ST Training	50 pm	140	-	140
Total for Environmental Education		2,850	1,150	4,000

Table 8. El Salvador. Environmental Protection Project
Budget for USAID Managed Costs ($000)

		FX	LC	Total
USPSC Project Manager	69 pm	1,050	-	1,050
Priority Technical Assistance	40 pm	500	50	550
Evaluations	2	200	200	400
Total AID Managed Costs		1,750	250	2,000

SOURCE SELECTION INFORMATION

Table 9. El Salvador. Environmental Protection Project
USAID Financing Analysis by Budget Element
($000, dollar equivalent of colones)

		FX	LC	Total	%
1.	Policy Reform	5,225	1,775	7,200	36
2.	Demonstration of Benefits	3,833	2,947	6,800	34
3.	Environmental Education	2,850	1,150	4,000	20
4.	USAID Managed Costs	1,350	650	2,000	10
	Totals	13,812	6,188	20,000	100

Table 10. El Salvador. Environmental Protection Project
Project Cash Flow by Fiscal Year
($000)

Source	FY93	FY94	FY95	FY96	FY97	FY98	FY99	Total
USAID	246	6,546	5,357	3,275	2,190	1,827	559	20,000
GOES	67	298	382	353	328	356	76	1,860
FOCAM	0	300	600	600	1,300	1,300	400	4,500
Local NGOs	0	0	75	169	189	207	0	640
Total Project	313	7,144	6,414	4,397	4,007	3,690	1,035	27,000

Table 11. El Salvador. Environmental Protection Project
Project Financial Plan by Input
($000)

Input	$000	$000 equiv.	Total	%
Technical Assistance	9,009	6,421	15,430	77
Training	623	724	1,347	7
Commodities	526	697	1,223	6
Project Management	1,550	50	1,600	8
Evaluation	200	200	400	2
USAID subtotal	11,908	8,092	20,000	100
FOCAM	-	4,500	4,500	64
SEMA	-	881	881	13
NGOs	-	640	640	10
CENTA	-	538	538	8
DGNR	-	234	234	3
CENDEPESCA	-	119	119	1
MOE	-	90	90	1
Counterpart subtotal	0	7,000	7,000	100
Project total				

Table 12. El Salvador. Environmental Protection Project
Payment Verification Matrix
for Methods of Implementation and Financing

	Method of Implementation	Method of Financing		Approx. Amount ($000)
1.	Policy and Demonstration Area Contract	Direct Reimbursement		14,000
2.	GREENCOM Delivery Order	Direct Reimbursement		4,000
3	USAID Managed Costs	Direct Reimbursement		2,000
	-USPSC Project Manager		1,050	
	-Priority Technical Assistance		550	
	-Evaluation		400	
Total				20,000

B. Procurement Plan

Project procurement will involve an institutional technical assistance contract for policy and demonstration of benefits, a buy-in contribution to the Greencom technical assistance contract for environmental education, a personal services contract for Project management, and institutional contracts for Project evaluation and auditing.

1. Policy and Demonstration Area Contractor

Components 1 and 2 of the Project will be implemented through the Executive Secretariat for the Environment (SEMA), which will be supported by an institutional contractor selected through full and open competition. The contractor will be expected to make its proposal acceptable to the rules of the World Bank's Global Environmental Facility, with at least $2.0 million in goods or services to be advertised world-wide and eligible for suppliers from countries within Geographic Code 935. The contractor will not only furnish long and short term assistance to the GOES, but will also undertake the procurement of commodities and the management of the human resource development activities. Procurement of the technical assistance Contractor will be accomplished directly by USAID.

The contractor will procure commodities, including the bidding, contracting, and transport of the Project commodities. Table 12 shows the commodities planned under the Project. USAID will retain the right to award this technical assistance contract without the procurement tasks, in the event that USAID direct procurement would better serve the requirements of the Project. Commodities financed under the Project, if not specifically proposed by the bidder as a GEF procurement, will have their source and origin in the United States, consistent with USAID's Buy America Policy as issued December 5, 1990. Customs clearance will be the responsibility of the Contractor, under the bilateral agreement between the U.S. Embassy and the GOES Training will be arranged by the Contractor consistent with the requirements of Handbook 10.

Local cost financing will be limited to the Contractor's staff in-country costs. Shelf-item procurement in local currency by the Contractor is permitted in accordance with prevailing regulations.

2. Delivery Order from GREENCOM

Technical assistance, commodity procurement, and training in environmental education and communication will be provided to participating GOES agencies and NGOs through a Project-funded contribution to the technical assistance contract awarded under the R&D/ED Environmental Education and Communication Project (GREENCOM), 536-5839. The contractor, selected through full and open competition managed from AID/Washington, will respond to a Project-funded delivery order. The contractor will not only furnish long and short term assistance to the GOES, but will also undertake the procurement of commodities and the management of the human resource development activities related to environmental education.

Table 13. El Salvador. Environmental Protection Project Schedule of Commodities

1. Imported Commodities

Policy and Demonstration Area Contract
8 each 4x4 passenger vehicle, suitable for rough terrain
30 each Motorcycle, 125 cc
2 each 15' aluminum boat, with 25 hp outboard motor
Spare parts and tires
Office equipment such as fax, microcomputers, software for San Salvador and field office

Environmental Education Contractor
2 each 4x4 passenger vehicle, suitable for rough terrain
Spare parts and tires
Office equipment such as fax, microcomputers, software for San Salvador office

2. Local Procurement

Fuel and lubricants (both contractors)
Seed, fertilizer, cooktops, etc. for incentive packages in the demonstration area

Note: No pesticides will be procured under the Project.

The contractor will procure commodities, including the bidding, contracting, and transport of the Project commodities. Table 12 shows the commodities planned under the Project. Commodities financed under Education Component of the Project will have their source and origin in the United States, consistent with USAID's Buy America Policy as issued December 5, 1990. Customs clearance will be the responsibility of the Contractor, under the bilateral agreement between the U.S. Embassy and the GOES. Local cost financing will be limited to the Contractor's staff in-country costs. Shelf-item procurement in local currency by the Contractor is permitted in accordance with prevailing regulations and the Buy America policy. Training will be arranged by the Contractor consistent with the requirements of Handbook 10.

3. Personal Services Contracts

Assistance in USAID's day-to-day oversight and monitoring of the project will be procured under a USAID direct personal services contract for a U S or third-country project manager. This person will also serve as the Mission's Environmental Advisor. In accordance with USAID policy, Program funds may be used for environmental advisors to the USG. The position will be governed by prevailing Mission policy for staff ceiling and allowable benefits.

4. Priority Technical Assistance

Prior to the arrival of the institutional contractor, short term technical assistance needs have been identified for the establishment of the EAI fund at FOCAM, for the National ENRM Strategy, and for environmental education planning. This assistance will be obtained through available Indefinite Quantity Contracts (IQCs) and buy-ins to centrally managed agreements. The buy-in mechanism will also be used to access specialized technical assistance under the regional RENARM project to complement the institutional contractor.

5. Evaluation Contracts

The two Project evaluations, more fully described in Section IV.D., on Monitoring and Evaluations, will be carried out by U.S. institutions under available IQCs or buy-ins under centrallt funded agreements

Table 14. El Salvador. Environmental Protection Project Schedule for Procurement

Action	P&D Contract	Delivery Order	Mgmt PSC	AID Managed Studies	Regional Buy-in	1st Eval.	Final Eval
Obligation	3/93	3/93	3/93	3/93	3/93		
PIO/T signed	4/93	4/93	3/93	3/93	4/93	3/95	3/98
RFP published	5/93	na	na	na	na	5/95	5/98
Proposals received	7/93	6/93	4/93	4/93	5/93	7/95	7/98
Contract awarded	8/93	7/93	5/93	na	na	8/95	8/98
Contractor on site	10/93	8/93	5/93	5/93	7/93	10/95	10/98

VI. SUMMARY PROJECT ANALYSES

A. Technical Analysis

1. Policy Formulation and Reform

The end of the war allowed Salvadoran citizens and the GOES to shift attention to longer-term issues, causing a swell of interest in sustainable use of natural resources The 1994 election and a new administration offer the chance to the NGO community and SEMA to influence the legal framework, the implementing regulations, and the means to induce compliance with natural resource laws.

GOES support for policy reform has been steadily increasing from a small base. The primary stakeholders in policies to be promoted by the Project are small farmers, rural water users, the fishing industry, and the electric parastatal, CEL. Of these, only CEL has taken initiative, promoting small areas of reforestation above its reservoirs. The other stakeholders either are not siezed with the need for change (e g. the fishing industry) or cannot mobilize enough local support to effectively promote measures for erosion control and clean water. Against these interests and sometimes overlapping them, are stakeholders whose interests are not to change the system. These include harvesters of firewood and shrimp larvae; poor families, especially those without land titles; and those who deliberately seek short term, unsustainable economic gain from over exploitation of land or marine resources. These groups can be expected to resist the imposition of a cost on their presently un-priced natural resources inputs.

Natural resources as a sector was ignored until 1990, when the prospects of peace became more concrete. A pair of studies were conducted in 1990 and 1991, making an inventory and preliminary analysis of the sector. Their conclusions, consistent with the environmental profile of 1988, showed that the absence of policy or the ineffective enforcement of existing policy had caused considerable degradation to water and soil, the slowest of natural resources to renew themselves. GOES attention to natural resource management now competes with health, education, and national reconstruction for limited Ordinary Budget allocations. With other activities having a higher profile and shorter term return, the Project is promoting policy reforms which do not increase the implementation cost to the GOES.

2. Environmental Education

To halt the spiral of natural resource degradation, Salvadorans will have to join forces to address issues of political will, economic opportunity, technical capability, and public awareness. The Project will support GOES programs, Salvadoran NGOs, and private enterprise to assist the spread of environmental education programs. These programs will have sufficient scope and quality to broaden policy dialogue, motivate environmentally benign behaviors, and reinforce environmental messages coming from other sectors. The overall program will coordinate increasingly complex environment and natural resource messages that are mutually reinforced in the formal education system, the mass media, and by the NGOs.

A measure of success will be the change in attitudes and behavior among Salvadorans regarding natural resource use and management. It is in this context that environmental education must be understood. in and of itself, environmental education changes attitudes and behavior, but it is more effective in complementing, reinforcing and helping to replicate the other Project-supported activities. Criteria fundamental to the environmental education program are

- The need to reach broad and influential segments of the Salvadoran public, spanning the socio-economic spectrum. This implies activities for distinct groups (rural vs. urban, literate or not, students and non-students).

- The importance of obtaining visible economic and social results early, to build initial support for activities promoted by the Project, especially at national decision-making levels.

- The vital role that public and private environmental organizations can play in broadening and stabilizing the institutional basis for environmental awareness; and the advantage to be gained by relating many activities to existing institutions or programs. The Ministry of Education reform of the grade school curriculum is one example; the national environmental education plan which SEMA will coordinate is another.

- The need to improve technical competence through training and practical learning experiences in a variety of fields, including curriculum design, media relations, natural resource interpretation, and participatory education.

Elementary schools provide the highest coverage of formal educational activities since 81% of children in school are at the elementary level. Current curriculum reform within the elementary school system and redefinition of education institutions' roles permit timely incorporation of natural resource concerns into formal education. Informal education activities will target a national audience through mass media. Correctly positioned media programs have proven successful in teaching literacy, agricultural technology and voting procedures. Visitation programs to national parks and protected areas use marked trails, guided tours, passive exhibits, and multi-media presentations to teach up to 200,000 visitors a year. Non-formal educational activities such as seminars and workshops will be carried out for decision-makers, communities, and NGOs. In general, these seminars can successfully heighten concern about natural resource use and management while identifying problems and seeking solutions

3. Demonstration of Benefits

The Demonstration Area was selected to show that sound natural resource management in the upper parts of a watershed contributes to the health of the mangroves below and the marine resources which depend on them. The result is improved incomes for inhabitants and users in all parts of the area. The criteria for selecting Demonstration Area were:

- A clearly delimited watershed area that displays the spectrum of natural resource uses in the Salvadoran coastal zone.
- Opportunities for education and outreach impact beyond the immediate NRM actions of the Project.
- Possibilities for establishing alternate local sources of income and employment in natural resource management with the potential for future support and development from international NGOs
- National-level environmental NGOs active in the area
- Local residents in the mangrove estuary aware of the shrinking aquatic resources and receptive to NRM practices.

The technical practices proposed for the Demonstration Area have been successfully used in Central America and are now used in a small project in El

Salvador. The challenge is not to develop new techniques, but to organize their dissemination, motivate acceptance, control the quality of execution, and develop a system to replicate use beyond the demonstration areas. The types of mechanical and agronomic soil conservation practices proposed for the Proyect are being currently used successfully in the Rio Las Cañas Project, and the FAO's Agro-forestry Project in Chalatenango, Morazan and Cabanas, as well as by similar projects in Honduras, Guatemala, and Costa Rica. The same is true of agroforestry practices and tree crop production Techniques for species site selection, tree establishment, management and information dissemination have been developed and tested over a period of more than ten years by the CATIE/ROCAP Tree Crop Dissemination Project and its predecessors which will complement and collaborate in PROMESA.

Given the relatively small size of the Demonstration Area, planned interventions and monitoring progress will initially be done by traditional techniques, such as aerial photo interpretation, questionnaires, and field observation. If the use of satellite images is needed to set the baseline, specific analyses will be contracted for this purpose.

Replication of the NRM techniques which will be demonstrated is feasible, since the major sunk costs of education, training, and policy reform will already have been financed by the Project and the IBRD Prisa loan. Planning for the replication will be assisted by the Project, reducing that cost also.

B. Beneficiary and Social Soundness Analysis

The Demonstration Area above the Barra de Santiago has an estimated population of 48,000, of which more than 95% are rural (preliminary data from the 1992 census are not yet available). In the population, four general groups can be identified:

- Foraging families who rely almost exclusively on extraction of fauna and flora from mangrove forests, the estuary, and the Pacific Ocean,
- Small farmers inhabiting the piedmont;
- Members of the five agrarian reform cooperatives, and
- Displaced families from formerly conflictive areas who are on the fringes of the estuary economy and society.

The Project methodology avoids engineering ecological protection via commands and sanctions, as well as extensive training and exhortation of the farmers. Rather, the Project will attract and include the potential beneficiaries in planning Project-supported activities. The message will be that the GOES has its agenda, while the farmers, fishers, woodcutters, etc. have theirs. The GOES agenda is ecological and economic; that of the population is almost entirely economic. The Project will build on the points of agreement, seeking those activities where the agendas coincide. This approach is consistent with conclusions of USAID project evaluations in many countries.

The environmental education activities and policy dialogue which are promoted under the Project seek to establish a popular consensus on the value of natural resources. Consensus, backed by solid analysis, represents the most viable means of brokering the competing users of water and forest resources. This consensus also makes the link between the upstream conservation practices

(costs) and the downstream users (benefits). The social dynamic of seeking consensus will require management by the GOES and NGOs, but permits the flexibility to achieve the Project policy objectives.

Protection of the estuaries, mangrove and upland forests, soils, and water presupposes the willingness of the population to forego, even if only temporarily, some traditional income sources. This willingness will not happen unless the practices being promoted by the Project open alternative sources of income. Therefore, the Project will present ecologically benign technologies as productive rather than protective techniques. Mangrove replanting, estuary species repopulation, buffer zone establishment and harvesting, hillside soil and water conservation, and reforestation will be embedded in an income generating context Although protection and restoration will be promoted, the strategy will be to show people that increased income can be obtained with more appropriate natural resource practices.

The social soundness analysis carried out in the Demonstration Area gathered much socio-economic data within a relatively short period. However, more extensive data, such as that gathered in the first months in the Demonstratoin Area, will be needed to fully validate the Project's impact. These data will also help to anticipate the spread effects of the Project, both within the Demonstration Area and to replication sites outside the Project, and to validate the economic analysis.

C. Institutional Analysis

1. Non-Governmental Organizations

Although one NGO was founded in 1949, Salvadoran NGOs are a recent phenomenon and typically have limited resources and experience However, there is no lack of enthusiasm, and in most cases, NGOs operate on a truly voluntary basis with unpaid staff. Most NGOs have an average yearly budget of less than $20,000. A few NGOs have fundraising programs, while the others depend upon voluntary contributions from their members and receive sporadic donations from the private sector. Table 14 summarizes the NGOs; a fuller discussion of the main NGOs is shown in Annex D.

NGOs have been successful since 1990 in mobilizing large amounts of popular participation in ENRM activities. This voluntary labor has complemented a series of 24 grants averaging $6,000 each from SEMA. Approximately ten similar sized grants have been received from international organizations. The NGOs, as a group, have performed well in the technical aspects of these grants, but are still maturing to the point where they could meet USAID accountability standards for direct assistance.

2. GOES Agencies

Secretaria del Medio Ambiente, SEMA. The leading organization in the GOES is CONAMA (Consejo Nacional del Medio Ambiente) - the ministerial level environmental council, with SEMA (Secretaria Ejecutiva del Medio Ambiente) as its administrative arm. CONAMA is responsible since its establishment for the coordination and oversight of policies and strategies to carry out national objectives for the defense of natural resources and the protection of the

environment. SEMA coordinates environmental initiatives across ministries and donor agencies, providing for nationwide environmental policy focus and promotion and monitoring of policies and legislation.

SEMA operates under the Ministry of Agriculture with an Executive Director and a staff of 19 technicians. The GOES and USAID jointly programmed local currency equivalent to $900,000 for SEMA, to fund the agency through calendar year 1992. In addition, SEMA received the equivalent of $130,000 in local currency from the Ordinary Budget for calendar year 1992. SEMA will receive $193,000 from the Ordinary Budget in 1993, with a supplemental grant of $761,000 from the Extraordinary Budget. It will be wholly financed by the Ordinary Budget in 1994 when the Extraordinary is merged with the Ordinary.

In the sixteen months of its existence, SEMA has advanced on formulating the National ENRM Strategy. At the same time, the inadequacy of SEMA's institutional placement within the MAG, became apparent. The weakness of CONAMA as a high level policy mechanism is also troublesome because of competing interests among its member Ministries. These problems are of significant concern to the entire donor community. The IBRD is reviewing an institutional analysis of SEMA which will permit a thorough review of the options available. This will also be one of three key areas of environmental conditionality under the IBRD's SAL II loan.

Centro de Tecnología Agropecuaria, CENTA. As the national institution responsible for agricultural research and extension, CENTA is about to be modernized with the $38 million PRISA loan from the IBRD. In particular, the PRISA extension component will provide for training in agriculture and animal husbandry, forestry and conservation of natural resources which will be useful in the DA of the PROMESA Project. By the end of 1993 all 80 of the national extension agencies will work under the EDO system or extension by objective, and at least eight agents from two agencies will be assigned to the PROMESA DA/ Other agents will participate in the in-service training in agro-forestry and soil conservation techniques sponsored by PROMESA at CENTA and in the DA. CENTA also has five experiment stations. Of the 3,000 employees of CENTA nationwide, approximately 20% are involved directly in natural resource management.

Dirección General de Recursos Naturales, DGRN. The DGRN contributes to the conservation and development of the natural resources of the country; soil, water, plants and animals. It is composed of the Division of Natural Resources (the former CENREN), National Park and Wildlife Service, Forestry Service, Soil Conservation Service, Watershed Management Service; Division of hydrology and meteorology, and the Division of Irrigation and Drainage. Under PRISA, the DGRN will be reduced from a staff of 1038 to 853 and the research units of forestry and soils moved to CENTA. The 1992 budget for DGRN was $2,960,000.

Centro de Desarrollo Pesquero, CENDEPESCA. The mission of CENDEPESCA is to regulate the fishing industry, transfer technology to fisherman, carry out research on the carrying capacity of the marine fishery, and control the quality of fish sold internally and for export. CENDEPESCA has three divisions· Research; Quality Control and training; and, technology transfer.

CENDEPESCA has five laboratories, three artesan fishing piers, and 253 staff. The budget for 1992 was $682,000 with additional funds from international for special projects.

Environmental Conservation Fund (FOCAM). FOCAM will serve as a funding mechanism for environmental programs to be accessed by local NGOs or in tandem with international environmental PVO programs. FOCAM contributions derived from other donor organizations, other country development programs or other sources of funding besides the EAI debt forgiveness accord, will be utilized to support environmental programs which most likely have been influenced to some degree by the results of PROMESA. FOCAM operations are financed by a fraction of its annual income.

3. Municipal Authorities

The Project Demonstration Area lies within the Jujutla and San Francisco Menendez municipalities. The municipalities are autonomous, and each controls a small budget with authority to charge fees but not taxes. Through a system of open town meetings, municipal government is one of the country's most participatory institutions. Both municipalities are interested in working with the Project, although the impact of their efforts to date in natural resource activities has been negligible. The municipalities are currently unable to do anything about the more conspicuous NRM problems such as mangrove cutting.

D. Economic Analysis

Environmental projects tend to have benefits which do not fit conveniently into benefit/cost or internal rate of return analyses. The specific mix of benefits, and precisely to whom they will accrue, cannot be accurately predicted. The timing and extent of the benefits is similarly difficult to foresee. Therefore, the analysis lists the types of anticipated benefits for each component and attempts to determine the minimum economic return which would be required to obtain a positive ratio of benefits to costs. The project manager then would use these minimum returns as a floor beneath the lowest acceptable project achievements.

The policy component is estimated to deliver its benefits over the period 1993-1999. In this period, the Project must generate a constant annual stream of benefits equal to $900,000 to $1,100,000 (depending on a 6% or a 10% discount rate) in order to have benefits in excess of cumulative costs. The education component benefits accrue over a longer term, through 2006. The annual benefits stream must exceed $950,000 to $1,250,000 in order to justify the investment. This benefit is roughly equal to one Salvadoran in seven giving $1 a year for environmental causes during the same period. For both components, the required benefit levels appear to be reasonable even at the standard 10% discount rate, and they are more so with a 6% rate. These minimum levels appear well within the Project's ability to deliver.

Project investment in the Demonstration Area is more difficult to value, since the benefits cannot be clearly attributed to the Project alone. The analysis shows annual economic benefits must increase gradually to a sustained level of $2.5 - $3.1 million in years 2003-2013 to show a positive ratio of benefits to

costs. This translates to $93 - $117 in total benefits per hectare in the Demonstration Area, a very high return if all benefits are assumed to be received at harvest by a small farmer. However, this amount includes some non-agricultural benefits that are anticipated to accrue to additional groups of beneficiaries, such as households and fishermen. The amount of these benefits would reduce the needed benefits per hectare. Still, the required sustained annual benefit stream is an ambitious target, obliging the project manager to contain the cost of implementing the component.

WPPPRJ1100
3/17/93

LOGICAL FRAMEWORK, ENVIRONMENTAL PROTECTION PROJECT (PROMESA)

GOAL	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	ASSUMPTIONS
To improve environmental and natural resource management.	Expanded use of improved NRM practice.	Before-and-after studies, evaluations, project/NGO records.	Implementation of the Peace accords, and political and social stability are maintained in El Salvador.
	Stabilized environment in terms of soil, water, forests and fisheries.	SEMA statistical information. UAP Policy Unit within OSPA.	No natural disasters occur during the life-of-project.
	Expanded international funding for NRM.	IFI and other donor records.	
		Project GIS.	

PURPOSE	END OF PROJECT STATUS	MEANS OF VERIFICATION	ASSUMPTIONS
To halt and then reverse degradation of El Salvador's natural resource base to safeguard year-round water supplies and rural incomes.	1 Key policy reforms enacted and implemented in natural resource management, including an established source of financial support for NGOs.	NRM National Strategy, Environmental Code, project records and evaluations, CENTA, CENDEPESCA and CENREN data	Continued political will and institutional capability needed to effectively enforce existing and new revised/reactivated environmental laws
		Completed strategy issued and periodically updated, and draft of laws and code submitted to Congress.	GOES NRM entities, particularly SEMA, maintain continuity and levels of effort
	2 Increased public support for sustainable management of natural resources.	Project records (M&E)	GOES budget/funding levels of NRM institutions increase over LOP
		Quarterly PROMESA reports	
		Surveys/opinion samples before-and-after, evaluations, audits	
	3 Models of successful technology transfer developed for implementing NRM practices and organizational schemes, and incorporated into other project components and replicated in other areas of country	NGOs and other participating organizations' publications and records, SEMA, CENTA, CENREN and CENDEPESCA project data, project evaluations and audits	Other resources are secured by project-strengthened institutions for sustaining their operations beyond the LOP.

ANNEX B

INITIAL ENVIRONMENTAL EXAMINATION

BASIC PROJECT DATA

Project Location:	El Salvador
Project Title:	Environmental Protection
Project Number:	519-0385
Funding:	$29 Million (LOP)
Life of Project:	7 years
IEE Prepared by:	Peter Gore USAID/ El Salvador Environmental Officer
Date Prepared:	December 20, 1991

RECOMMENDATION FOR THRESHOLD DECISION

The PROMESA Environmental Protection Project is designed to ameliorate the negative effects of economic development upon the environment in El Salvador. It will support Salvadoran efforts in policy formulation, will promote natural resource oriented NGOs, will foster environmental education, and will show the linkage between appropriate use of natural resource and sustainable economic development. As such, the Project does not present negative environmental impacts as defined in 22 CFR 216. However, in the course of interventions in the demonstration areas where direct actions will be taken to improve the management of soil and water resources, some perturbation of the environment may occur. Therefore, a positive threshold decision is recommended and an environmental assessment is required which may be carried out concurrently with project design.

John Lovaas
Acting Mission Director
USAID/El Salvador

1/20/92

Approved.

James Hester
LAC/Environmental Officer
AID Washington

Date

Doc 277WPPRDO

ANNEX C Technical Analyses

1 Policy

2 Environmental Education

3 Profile and Selection of Action Areas

4 Forestry and Agroforestry

5 Watershed Management

6 Mangrove Estuary Resource Management

Associates Inc

ENVIRONMENTAL PROTECTION PROJECT

PROTECCION DEL MEDIO AMBIENTE SALVADOREÑO

P R O M E S A

519-0385

PROJECT PAPER

ANNEX E

NATURAL RESOURCE
POLICY
FORMULATION
AND REFORM
COMPONENT

May 1992

by

Rubén D. Núñez, Ph.D.

Work Conducted for USAID/El Salvador under Sub-Contract with
Pan American Development Foundation
San Salvador

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4. PROPOSED PROJECT INTERVENTIONS

The outputs of the policy component will address USAID/El Salvador Strategic Objective No 5, **to improve environmental and natural resource management**, by achieving the program output of creating a **natural resource use policy framework** This program output is achieved by the policy component and its interaction with the institutional strengthening and environmental education components These three components, in addition to the action areas component contribute to the attainment of Strategic Objective No 5

The policy formulation and reform component will contribute directly to the Project's purpose **to develop environmental institutions, policies, and public awareness to slow or reverse degradation of El Salvador's natural resource base (soil, water, forests)** This component will work with SEMA to assist the GOES in producing a national environmental and natural resources management strategy and an improved policy and regulatory framework This will be achieved through technical assistance (TA), commodities and financial resources to conduct studies, train professionals, and provide fora for the interaction of the public and private sectors, local communities, farmers and concerned members of society

In the implementation stage, the Project will focus on policy analysis techniques that incorporate the costs and benefits of degrading or improving the natural resource base Local NGOs representing a broad cross-section of interests (nationally and in the "demonstration action areas") will serve as sounding boards to discuss possible policy options and impacts This approach will foster broad-based understanding at the local level of the environmental and economic consequences of failing to adopt sound NRM policies. NGOs will also provide valuable inputs to the policy formulation process They will help inform government as to workable, sustainable, and realistically enforceable solutions This will contribute to creating consensus at the national level to approve legislation that will protect and improve the natural resource base of El Salvador

Figure E 1 illustrates how the Project will impact the supply of and demand for natural resource policy reform Present lack of knowledge and understanding of the impact of policy on the natural resource base makes the supply curve steep That is, the government is somewhat reluctant to adopt favorable natural resource policies, and additional reforms have a high marginal cost With the Project, the supply curve for policy reform will become flatter as policy makers increase their awareness about the environmental issues and the impact of policies on the natural resource base Such awareness will make the government more receptive to adopting natural resource policies

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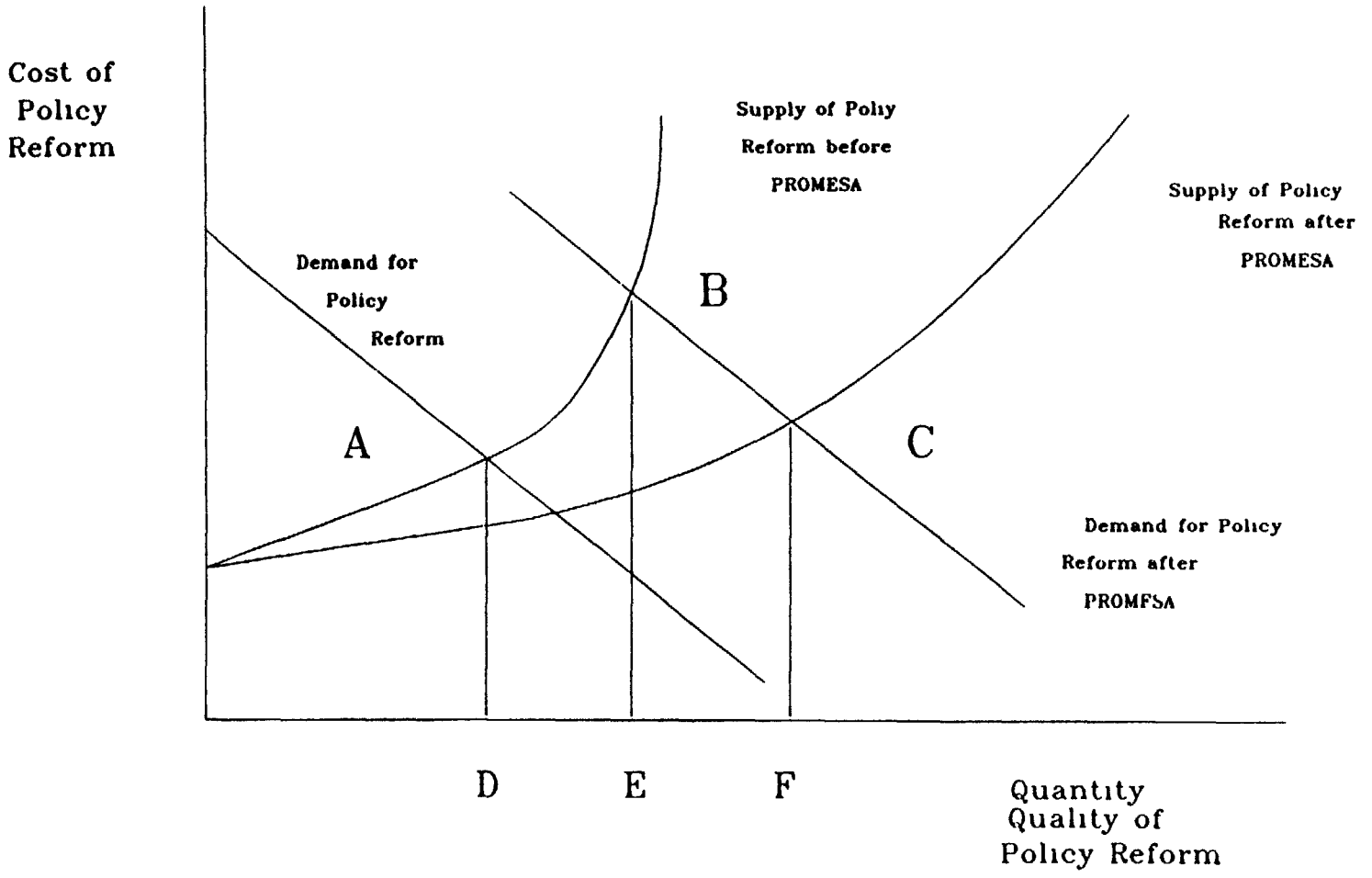
Figure E.1 Demand For and Supply of Policy Reform, and Impact of PROMESA



The demand curve represents the desire of the population for policy change Again, due to the lack of understanding, NGOs and the general population do not perceive the importance of policy to achieve socially desirable goals, mainly preserving or enhancing the natural resource base The participation of NGOs in policy analysis studies, in the addition to the impact of PROMESA's institution building and environmental education components, will stimulate NGOs to demand more policy reforms as they realize the important effects policy has for the environment

These objectives of the policy components will be achieved through activities with the following common elements

- SEMA will be the central coordinating institution for NRM policy reform,
- Policy issues will be classified by problem, area, and subject One possible classification system to be used is the policy taxonomy being developed by APAP II for the RENARM Project,
- Inter-institutional (SEMA, other GOES institutions and NGOs) and multi-disciplinary (ecology related scientists and social scientists) teams will be formed to address each problem, area or subject [1] These teams will follow the structure of SEMA's National Consultative Committee and coordinate their work with SEMA's Technical Consultative Council The Environmental Committee of the National Assembly will be invited to participate in the teams when a legislation modification is required,
- Each team will design a workplan identifying information gaps and studies required to formulate a particular policy,
- Specific teams or NGOs will be contracted or commissioned to conduct the studies,
- Studies and policy papers will be presented and discussed in a wider audience, assuring the participation of all the institutions and persons that could make a significant contribution, could implement or enforce the policy, as well as those that will be affected positively or negatively by the policy,
- Participation of local communities will be assured by incorporating selected local organizations in the policy discussion process, and incorporating the results of the participatory rural appraisal methodology that will be used at the municipality level, and

[1] Key issues are discussed in the following sections

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- PROMESA will coordinate with other USAID funded projects that have a presence in environmental policy making both nationally and in the AAs (example, the Cooperative Production and Marketing, and the Agribusiness Development projects), or work with GOES institutions participating in policy formulation, implementation or monitoring (example, the Agrarian Reform Sector Support Project)

Other donors will also be providing assistance to SEMA on policy issues PROMESA's assistance will be closely coordinated to avoid overlaps For example, PROMESA will not get involved in brown type (pollution) environmental issues, and it has been agreed that the IDB will assist SEMA on developing a national system on environmental impact assessment, thus, PROMESA will not invest resources in this issue

4.1 Activities

The policy formulation and reform component will have four activities

- Development of the national environmental and natural resources management strategy,
- Training and TA to support policy analysis,
- Fora to foster policy dialogue, and
- Consolidation and refinement of existing laws and regulations.

A discussion of each activity follows

4.1.1 The National Environmental and Natural Resources Management Strategy (NRM strategy)

The strategy will provide the basis for formulating a package of policies, actions, plans and projects to achieve sustainable economic growth in El Salvador Sustainable economic growth can only be achieved through good NRM that contributes to preserving or improving the NR base of El Salvador The strategy will integrate the goals of economic and social development with the sustainable use and management of natural resources

FESA drafted the Action Plan for the National Strategy for the Conservation and Management of Salvadoran Natural Resources in March 1991 SEMA used this plan to commence the development of a NRM strategy In the process, SEMA produced an Agenda Ambiental y Plan de Acción (Natural Resources Agenda and Action Plan), which will be used as a discussion document to start drafting the national NRM strategy

The original SEMA design for a NRM strategy included implementation plans in the following areas

- Land use planning,

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- Reforestation,
- Watershed management,
- Protection and conservation of national parks and wildlife,
- Environmental education,
- Protection of coastal zones and water resource,
- Preservation of the air, and
- Reduction of environmental contamination

During PROMESA PP design, Carlos Linares from WRI worked with SEMA to refocus the framework of the Strategy based on SEMA's capabilities and identification of key natural resource and environmental problems The new framework is as follows

- Environmental contamination
  - Water contamination
  - Air contamination
  - Soil contamination
  - Basic Sanitation
- Natural Resources
  - Soil(*)
  - Forests(*)
  - Water(*) - watersheds
  - Biodiversity
  - Coastal and marine resources(*)
- Institutional strengthening
  - Legal(*)
  - Finance(*)
  - Health
  - Agricultural Development
  - Evaluation of environmental impact
  - Research and information
- Environmental education(*)
  - Training
  - Communication - dissemination
- Formulation and reform of environmental policy in
  - Environmental contamination
  - Natural resources(*)
  - Institutional strengthening(*)
  - Environmental education(*)

PROMESA will <u>only</u> assist the development of those areas with an asterisk

The action plan includes the following steps for each resource (land, forest, water, fisheries, wildland) and subject (i e , environmental education, legislation and environmental policy)

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- Revision of basic documentation,
- Analysis of present situation,
- Strategic proposal of sectorial integration, i e , how institutions should be integrated and coordinated, and
- Development of the strategy, which includes policies, plans, programs, and projects

The pressing policy issues will be discussed at the community level with the assistance of local NGOs, municipalities, local organizations, and ISDEM

The Policy Advisor will work with the Institutional Development Specialist, the Environmental Education Specialist and specialized short-term TA to organize the consultation meetings to discuss and produce the NRM strategy

The completion of this effort will take place over the first two years of the Project This period is to allow adequate time to carry out consultations at the national level with key GOES officials, NGOs and local groups

Costa Rica went through a similar process to design its strategy (ECODES - Estrategia de Conservación para el Desarrollo Sostenible de Costa Rica) The PROMESA team will draw on the Costa Rican experience Applicable experiences to El Salvador will be incorporated as deemed appropriate

To date, progress has been made in the forestry component of the NRM strategy SEMA is coordinating the Plan de Acción Forestal (PAF - Forestry Action Plan) This PAF is part of a world-wide effort (TFAP - Tropical Forest Action Plan) sponsored by FAO, PNUD, the World Bank and WRI PNUD will provide support to this activity in El Salvador, and PROMESA will complement this effort by facilitating interactions at the community level

4.1.2 Training and TA to Support Policy Analysis

Social scientists, ecologists, and other professionals working on natural resource issues have indicated the need to improve their ability to conduct policy analysis Natural resource policy analysis involves technical elements from different fields in the natural and social sciences An understanding of both is necessary for sound natural resource policy analysis The Project will bring together professionals from SEMA, other GOES units, educators and NGOs interested in policy analysis or implementation to a common ground, where they can better understand the complex mix of issues and constraints involved in natural resource policy analysis The first step will be to create a common understanding of basic natural resource and economic principles among the various groups

The Project will strengthen the capacity of SEMA to analyze, formulate and monitor policy reform by providing direct technical assistance and training Other GOES institutions

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and NGOs will be strengthened through their interaction with SEMA Their involvement will be mainly through their participation in the National Consultative Committee The most important linkages will be with the following institutions

- UAP/OSPA/MAG This unit analyzes the impact of policy on the agricultural sector, and coordinates with SEMA the analysis of the impact on natural resources,

- Programming and Projects Division/OSPA/MAG This unit works with SEMA and other natural resource institutions in project preparation and in assigning budgetary support Through an improved understanding of NR issues, they should be more supportive of investment in NRM,

- GAES/MIPLAN This institution analyzes macroeconomic policy, and as such it needs to be aware of the impact and implications of macroeconomic policy for natural resources,

- DAIP/MIPLAN This office approves public investments Thus, they are a critical link to the approval of investment projects in natural resources, and the incorporation of environmental impact in project analysis,

- Directorate of Renewable Natural Resources/MAG This is a key natural resource policy implementing agency, and as such, it must be included in PROMESA activities PROMESA will assist on forestry, national parks and wildlife, and water policy,

- CENDEPESCA/MAG This agency implements fisheries policies,

- CENTA/MAG This agency will be assisted on forestry research and extension policy

- Economic Policy Area/Central Bank They analyze and formulate monetary, foreign exchange and credit policies They also prepare the national accounts PROMESA will assist them in analyzing the impact of policies on the natural resources, including their relationship with the national accounts,

- Environmental Committee of the National Assembly and other interested key members of the Assembly PROMESA will assist this committee in analyzing and drafting natural resource laws, and

- Environmental Unit of the Prosecutor's office This unit will be trained in natural resource offenses and it will be incorporated to the group that will draft

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the Environmental Code [1]

Policy analysis requires the use of information At the present moment information on natural resources and the economy is dispersed PROMESA will work with SEMA to develop a NR information system to be used for policy analysis The expertise to organize and set up the information system, as well as the computer equipment and access to international data bases will be provided by PROMESA, SEMA will supply the operating costs and personnel PROMESA will assist SEMA to identify basic physical, economic and social indicators which reflect the current state of El Salvador's natural resource base

The policy work will be organized around specific issues Inter-institutional and multi-disciplinary teams will be formed around each issue, following the structure of SEMA's National Consultative Committee SEMA already has had experience with this methodology in drafting the Environmental Agenda and Action Plan The country had similar experiences in drafting the Environmental Profile and conducting the Natural Resource Policy Inventory

These groups or committees will draft a workplan, with specific targets and products They will identify the studies needed and determine the best avenue to conduct them Study proposals may also originate from NGOs or be identified by the PROMESA team, a GOES agency or by USAID The identified studies will be selected for funding on the merits of priority and potential impact Studies will be conducted by local specialists assisted by expatriate TA from one of the Consortium members or subcontractors

Policy analysis will identify divergence between private and social costs and benefits It will also identify distortions which induced the population to use resources beyond their sustainable level Alternative solutions will be tested and discussed with the participation of local communities, associations, NGOs and the GOES institutions that would implement the policy

When enforcement is required, alternative enforcement arrangements will be examined, involving the participation of local entities to determine feasible means and effective ways of enforcing the regulation The participatory rural appraisal methodology will be instrumental in identifying policy needs and workable solutions acceptable to the direct users of natural resources A Rural Sociologist or Anthropologist will participate in this process to incorporate methodologies that identify the reasons why people use the resources in the way they do, and identify the type of alternatives that will induce them to adopt sustainable practices

Each proposed activity will submit a budget for approval by a committee comprised of the PROMESA team and representatives from SEMA and USAID This will ensure

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[1] The Environmental Code is discussed in section 4 1 4

coordination between the components, USAID policy activities and program priority, and SEMA's workplan

PROMESA will continue the work started by WRI to incorporate natural resource depletion or enhancement in the national accounts This will be coordinated by SEMA, with the participation of the Central Bank, MIPLAN, the Directorate of Renewable Natural Resources at MAG, OSPA, FUSADES, and FESA The completion of this activity requires additional information not available at the moment PROMESA will assist in the preparation of alternatives to fund the cost of obtaining the additional information required This activity will be closely coordinated with the Technical Support Policy Analysis and Training Project (0349), which is providing assistance to the Central Bank to modify its methodology to estimate the national accounts

The base study will be completed during the first two years of PROMESA This study will be useful to

- Identify critical information needs,
- Provide a perspective on the order of magnitude and significance of natural resources in the national account,
- Provide a document to discuss with the GOES the importance of considering natural resources in the national accounts,
- As a training tool, and
- A starting point to design a methodology to collect information

The national accounts provide an index to measure a country's performance An intermediate step to incorporate natural resources into the national accounts would be to establish a separate index or set of indicators to determine the yearly change in the state of natural resources in El Salvador This activity will be coordinated by SEMA and implemented by the Directorate of Renewable Natural Resources and CENDEPESCA, with the assistance of FESA, which will provide local consultants to perform certain tasks

PROMESA will assist the GOES in developing the appropriate physical and human resources to measure changes in the basic physical, economic and social indicators of the resource base PROMESA will provide SEMA with assistance to analyze changes in El Salvador's natural resource base as measured by the indicators, and to recommend and implement policies which enhance the utilization and/or conservation of the natural resource base

The soil loss data generated by the national accounts exercise, in addition to data from other soil conservation projects in El Salvador will be used to introduce valuation techniques that incorporate resource depletion or enhancement in estimating the returns of alternative investment projects Methodologies developed by APAP II and other projects will be taught and applied in El Salvador

The Nature Conservancy (TNC) plans to provide assistance to the GOES to help create the Fondo para la Conservación Ambiental (FOCAM - Fund for Conservation of the Environment) A proposed "Ley de Creación del Fondo Para la Conservación Ambiental" (Law to Create FOCAM) has been drafted FOCAM will be a facility to transfer financial resources (internal and external) to environmental and natural resources projects

FOCAM will be an important complement to PROMESA, as it will provide local resources to fund intervention projects for natural resource conservation, as well as counterpart resources to implement PROMESA

The Enterprise for the Americas Initiative (EAI) offers an opportunity for some countries to reduce their debt while improving the environment The 1990 US Farm Bill authorized the Administration to restructure the P L 480 Food for Peace debt for eligible Latin American and Caribbean countries These debts would be reduced and the interest on the obligations could be paid in local currency into an environmental fund (Gibson 1990)

To be eligible, countries must have an Investment Sector Loan (ISL) from the IDB, or otherwise be implementing comprehensive investment reform El Salvador is already negotiating an ISL with the IDB, which will be approved by August or September of 1992

Bolivia has already succeeded in creating a National Fund for the Environment (FONAMA), and an Enterprise for the Americas Environmental Account at FONAMA This experience can be used as a model in designing FOCAM and the EAI account in El Salvador

Once the FOCAM is created, PROMESA will provide assistance in setting up an Environmental Account, and make an initial contribution to that account This Account will comply with the "Food, Agriculture, Conservation, and Trade Act of 1990," Title VI - Enterprise for the Americas Initiative, so that the Account could be eligible to receive funds that qualify under the EAI when the corresponding appropriation legislation is approved by the US Congress

The US Congress did not approve FY'92 Foreign Operations Authorization and Appropriations legislation prior to the start of the fiscal year last October 1 Consequently, funding for foreign assistance proceeded under a continuing resolution Thus, PROMESA's contribution to FOCAM will be very important to start the institutional strengthening of NGOs and lay the groundwork for the country to effectively use the additional funds that will be available once the US Congress approves EAI debt reduction for El Salvador and an Environmental Framework Agreement (EFA) is signed

ROCAP financed, through the Regional Natural Resource Management (RENARM) Project, a Natural Resource Policy Inventory that was conducted by an APAP II team in 1990 This inventory identified the most important policies affecting El Salvador's natural resources, proposed some alternative solutions, and identified areas that needed further

analysis In late 1991, USAID/El Salvador financed a study conducted by Serrano, McCaffrey and Marin, titled "The PROMESA Project and Environmental Policy in El Salvador " This study classified the proposed policy actions under PROMESA as

- Public investment,
- Information,
- Incentives and disincentives, and
- Regulations

This document was presented and discussed at a meeting attended by a select group of professionals from the GOES and NGOs, who participated in an exercise to identify a key problem within each area, propose a policy, and indicate the responsible entity to implement such a policy The exercise was useful in providing a diagnosis of some issues

- Professionals need training to develop a common language and understanding across fields of expertise,
- Most participants indicated the importance and need for further training in policy analysis,
- Natural resource policy analysis requires a multi-disciplinary approach,
- It will be more practical to group professionals around a specific issue instead of "modes of policy action " The group would then perform or commission a study, and the study would be presented to a wider audience for consensus building;
- The most important public investment policies identified were
  - Land use planning, and
  - Establishment of mechanisms to require environmental impact analysis for investment projects,
- For information the priority policies were
  - Research, extension and training on natural resource management, and
  - Human resource development and institutionalization of natural resource functions,
- For incentives/disincentives the priority policy was
  - Use of multi-disciplinary teams in designing incentive policies, and
- In regulations, unanimous agreement was reached on
  - Drafting an Environmental Code to provide a more comprehensive legislation to penalize offenders

In reviewing the Natural Resource Policy Inventory conducted in 1990, the document prepared by Serrano et al , the Environmental Agenda and Action Plan prepared by SEMA, and following interviews with different people at AID, the GOES and NGOs, the following

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policy issues are clearly priorities [1]

- Land use planning This was a priority policy selected by the policy workshop held in April There are two Land Use Planning law proposals at the moment, in addition to a draft of a Soils Law However, these drafts were set aside and a new interinstitutional group has been formed to draft a new proposal PROMESA will provide assistance to this group to contribute to an improved analysis and consensus building through a wider participatory and consultation process The new proposal will combine the concepts of both the land use planning and soils laws,

- Incentives for conservation practices Conservation programs in developed and underdeveloped countries usually require incentives These incentives are required either because the farmer does not have the resources, or because his benefits are lower than his costs, however, the benefits to society are greater than his costs The agroforestry project implemented by MAG and FAO has demonstrated that Salvadoran farmers need incentives to invest in conservation practices Sometimes the incentives designed conflict with other policies, or create undesirable distortions Example, one popular incentive is cheap credit, which conflicts with monetary policy and savings mobilization in rural markets Following the same example, even if the credit has a market interest rate, the management cost of very small loans (i e , ¢400/farmer) is very high, which wastes resources This is the case of the agroforestry project in Cabañas They had a loan fund of one million colones with a yearly management cost of half a million colones It would be more efficient to give the farmers the inputs, instead of the loan, saving half a million colones in bureaucracy,

  Officials at the Ministerial level are presently debating the incentive schemes that the MAG could adopt at the national level PROMESA will provide assistance in analyzing the alternatives, test the most promising ones in the action areas, and assist the GOES in implementing the most appropriate set of incentives to stimulate investments in conservation practices without conflicting with other macroeconomic policies, such as monetary and credit policies,

- Examination of the role of the government and the private sector in natural resource management and policy FESA has a management contract with MAG to manage El Imposible national park This was done on an exceptional basis, and there is not a clear policy stating that this is the route the government will follow The resurgence of NGOs to conduct studies, manage

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[1] These policy issues are not ranked in order of priority

resources, and educate the public on the environment is creating confusion in the government and the private sector as to what should be their respective roles Thus, there is a need to study and analyze the functions of each and formulate a clear policy,

- Natural resource policy to support sustainable agriculture production The Minister of Agriculture is interested in formulating a National Policy on Sustainable Agriculture Production This policy will probably enter in conflict with the persistent concern of the GOES to produce basic grains [1] The Ministry of Agriculture expressed in a meeting held at the PMA that he was astonished when he read a report indicating that the soils of El Salvador's hillsides, where basic grains are produced, only had 25 years of productive live, if present farming practices continue at their present rate He then expressed to his high level officials (Directors of all the major offices in MAG), and the international community present at the meeting (FAO and PMA) that he wanted to design a sustainable agriculture production policy for MAG He further expressed that this would be his top priority in order to make other policies of MAG (i e , agricultural research, extension, production, and NRM) conform to this sustainable production policy Given that PROMESA is not a sustainable production project, this policy will be addressed in its relationship to NRM, mainly soil, water and forests Sustainable agricultural production is directly related to soil erosion and quality, water availability, which is related to forestry, and the use of conservation practices (wind brakes, retention ditches and others),

- Protection of wildland areas already designated by the Phase I agrarian reform cooperatives The original farms distributed by the Agrarian Reform had wildland areas that were designated by the Agrarian Reform Law However, this has not taken place PROMESA will facilitate this process by assisting SEMA in analyzing and addressing the issue, and promoting consensus to implement this policy;

- The agrarian debt The policy analysis will explore the possibility of swapping debt for investment in conservation and protection by the cooperatives themselves and small farmers under Phase III, Decree 207 The possibility of paying this debt is very remote, placing a financial burden on farmers credit facilities PROMESA would explore and promote this arrangement, which has a high probability of acceptance,

- Debt-for-nature swaps PROMESA will explore the possibility of converting

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[1] A significant amount of basic grains is produced on steep slopes, eroding the soils Substitution will have to take place, reducing the amount of basic grains produced

some of El Salvador's foreign debt to purchase land for parks and reserves,

- Environmental education Exploration of issues will be closely coordinated with the environmental education component Article 3 of Decree 73 establishes that CONAMA will design a master plan for environmental education SEMA has expressed some policy guidelines and specific policies in its "Agenda Ambiental y Plan de Acción," pp 57-58 These guidelines and specific policies will need further analysis and discussion to integrate elements that are still not defined, such as who and how is environmental education going to be conducted? what is the required knowledge of students at the sixth grade? what will be taught in the schools and by who? will this be a requirement of the official school system, and optional for private schools, or will it be a requirement for all schools? who is going to train the teachers, and with what resources? what will be the minimum standard achievable under the present school system of El Salvador?, and

- User fees tied to the social cost of conservation and management of natural resources, such as water While this is the most critical policy affecting the use and management of natural resources in El Salvador, it is the most difficult to modify The present pricing system of electricity and water for human, industrial and irrigation purposes is creating the following distortions
  - People as individuals are using more electricity than is socially optimal,
  - People waste water,
  - Farmers waste water in low return activities, i e pasture for grazing,
  - There is a transfer of resources from the poor to the rich Many rural areas don't have electricity or running water The rich use more electricity and water than the poor Thus, Government and USAID subsidies to generate electricity and provide water are being transferred to the rich at higher rates than to the poor,
  - Society as a whole is paying higher prices for electricity, as it costs more to generate electricity in small private generators than it costs to generate electricity in large units,
  - The lack of a steady flow of electricity reduces GNP (less electricity is produced, and some factories produce less), and costs of production increase, making the country less competitive,
  - Cheap electricity limits private sector participation in electricity generation, as they would lose money by selling electricity at prices below cost of production,
  - Farmers waste water, increasing soil erosion,
  - ANDA does not provide adequate amounts of water of good quality, and
  - There is a direct effect on conservation as the utility companies do not have resources to invest in conservation and management practices to protect the watersheds

PROMESA will address these issues and work with SEMA in the design of alternative means to modify the present tariff structure to induce a more efficient use of water, along with conservation practices in critical watersheds

The types of training supported by PROMESA in this component will include

- On-the-job training The Policy Advisor will work closely with SEMA and the other institutions in the design and preparation of studies conducted by the work groups The Policy Advisor will work with the technicians involved in designing the methodology to conduct the analysis and train the participants in the methods or techniques involved One example of the tools to be used is the policy analysis matrix, which uses spreadsheet software (Quattro Pro, Exel or Lotus 1-2-3) to determine divergence between social and private costs and benefits Another example is the use of the RAPID IV and EDEN models These are computerized policy simulation tools developed by the RAPID III project useful in demonstrating the effect of population growth on the natural resources, and it is available for use by USAID projects,

- Policy dialogue seminars designed around specific topics The studies on policy analysis will be presented to a wider audience, becoming a training tool to teach about the methodology used, and learn from the participants about their views and approaches to the issue,

- Short courses identified throughout project implementation Educational gaps will be identified during project implementation Interviewed social scientists working on natural resource policy have expressed interest in learning more about natural resources and the environment Ecologists have also expressed interest in learning more about the relationship of policies and the management of natural resources Short-courses will be designed on these topics in conjunction with the environmental education component,

- Participation in selected international meetings, mainly in Central America PROMESA will sponsor participant training activities for selected individuals to attend seminars and international meetings covering issues directly relevant to El Salvador's natural resource management,

- Courses in other countries, such as the course offered by OTS in Costa Rica for policy makers, the Natural Resource Policy course offered by USDA, and the Agricultural and Natural Resources Policy Analysis course offered by the Food Research Institute [1]

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[1] Reference to other good courses can be found in Catherine Hoke, Jens Sorensen and John Swallow, "Short-Term Training Opportunities in Environment and Natural Resources "

The Project will also use the Central American Peace Scholarships (CAPS) and the Caribbean and Latin American Scholarship Program (CLASP II) managed by OET These programs have trained 25 Environment Promoters and 22 Environmental Educators in El Salvador In June, 1991 another 28 Environment Promoters and 20 to 25 Environmental Educators will start the program The Project will continue to identify educational gaps and needs, and submit applications to this program, beginning in June 1993 Additional training outside El Salvador will be coordinated with OET to ensure the Project complies with USAID regulations

The result of the analyses conducted by the work groups will be used to elaborate the NRM strategy, consolidate and refine existing laws and regulations, and be presented at the fora sponsored by PROMESA

4.1.3 Fora for Encouraging Policy Dialogue

Policy formulation and implementation starts with good policy analysis However, the analysis needs to be presented to a wide audience for discussion and participation in the process of refining and gaining consensus for policy formulation Furthermore, implementation will be facilitated as the institutions and the population affected are empowered and take ownership of the policy proposal

The Project will provide technical assistance and resources to facilitate policy dialogue among the government, the private sector (NGOs, the business community, educators) and the population in general This will be a key element in designing the national NRM strategy and in formulating critical policies for natural resource conservation and management The types of fora assisted by the Project will include

- Seminars to present and discuss the results of studies sponsored by PROMESA The policy analysis conducted under the previous activity will be presented to a wider audience of farmer organizations, legislators, government representatives, NGOs, business organizations, universities, and local media to discuss the findings, policy alternatives and draw conclusions on the best policy options and the steps required to implement and monitory the suggested policy;

- Workshops to discuss specific policy issues In some instances the policy in question will require the active participation of selected professionals and institutions to draft or formulate a particular policy or law before it is discussed in a wider audience. These workshops will be assisted by specialized TA on the specific subject,

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Washington, D C USAID/R&D/Office of Environment and Natural Resources, January, 1992

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- International meetings to discuss policy issues relevant to other Central American countries PROMESA will sponsor the participation of key individuals in international meetings held in Central American countries designed to discuss a particular issue of concern to El Salvador Fisheries policy is one example of such issues, and

- Meetings at the village and municipal level to discuss policies relevant to the community, and extract ideas on policies identified by communities throughout the country These fora will be part of the participatory rural appraisal methodology to be applied in the action areas

The planning and design of these fora will be closely coordinated with the other components of the project, specially the environmental education component This component will provide experts in seminar organization and participatory approaches to increase active contributions from participants The institutional strengthening component will identify key NGOs and individuals who would participate or sponsor the fora The action area component will provide experts in specific areas, scientific information on species behavior, identify policy constraints at the local level, and the participation of local farmers and fishers in the fora The Administrative component will provide the management, logistics, and organizational support to make each forum a success

4.1.4 Consolidation and Refinement of Existing Laws and Regulations

The key laws that need to be studied, discussed, and modified or approved are the following

- Environmental Code,
- Forestry legislation,
- Soils legislation,
- Water legislation, and
- Wildland protection legislation

PROMESA will provide assistance in reviewing and suggesting means of modifying these laws, as well as support for fora to discuss them Other laws and regulations will be identified during implementation

Environmental Code Participants in the NRM policy workshop held in April to discuss the policy priorities for PROMESA, selected the Environmental Code as the main policy needed for regulation SEMA also identified this legislation as priority in its "Agenda Ambiental y Plan de Acción," p 78

The Environmental Code will provide a legal framework to integrate environmental related components of all the laws in El Salvador and cover some voids, such as the definition of liabilities for government officials managing natural resources and regulations

The Code will facilitate the legal consultation process as it will consolidate all the laws affecting each resource For example, forestry regulations are covered in the following eleven pieces of legislation

- The Forestry Law,
- The Constitution of El Salvador, Art 106, 113, 117 and 131,
- Internal Regulation of the Executive Branch, Art 41, Items 2, 3, 4, and 12,
- Municipal Code, Art 4, Items 1 and 10, Art 18, 31 Item 6, Art 32, 35, 118, 125, and 138 to 155,
- Penal Code, Art 346, 353, and 355,
- Agrarian Law, Art 94 to 98,
- Basic Law of the Agrarian Reform, Art 4,
- Regulation for the Establishment of Salt Factories and Aquaculture in Salty Forests, Art 1 to 10,
- Decree No 47, Establishment of the Second Soil Protection Zone of Chalatenango, Art 1 to 8,
- Decree No 39, Planning Regime for the Metropolitan Region of San Salvador, Art 1 to 14, and
- Decree No 124, Regional Park of the Farm "El Espino, Named "The Parrot Forest "

In the case of water there are at least 34 pieces of legislation that affect its management, for soils there are 13, and for flora and fauna there are also 13

The Environmental Commission of the National Assembly expressed their interest and the need for technical assistance to draft this Environmental Code At present, El Salvador has the following Codes

- Civil Code
- Penal Code
- Municipal Code
- Commerce Code
- Health Code
- Mining Code

An Environmental Code would provide a stronger tool to prosecute environmental offenders

Forestry legislation The Forestry Law is outdated and its Regulation (Reglamento) was never written The system of incentives and penalties does not reflect the realities of the country Inflation has made the fines ridiculously low, and the incentives provided are insignificant SEMA identified this as one of the priority laws to be revised in its "Agenda Ambiental y Plan de Acción," p 77 The Environmental Commission of the National Assembly also expressed their interest in reviewing this legislation as a priority in the present

year

Soils legislation The Sub-Directorate of Natural Resources of MAG (previously CENREN) drafted a Soils Law that was never submitted to the National Assembly There are two proposals of land use planning laws that are been discussed by the Environmental Commission of the National Assembly SEMA also identified Land Use Planning as one of the priority legislation in its "Agenda Ambiental y Plan de Acción," p 77 There is a need to integrate all these drafts, analyze them and draft a new proposal that has the consensus of all the parties involved The Environmental Commission of the National Assembly already expressed the need for PROMESA to assist them in this venture

Water legislation SEMA has expressed interest in a "Ley General de Aguas" in its "Agenda Ambiental y Plan de Acción," p 78 A draft was written by the previous Government, and it has been shelved at the Presidency offices USAID funded studies for drafting an Irrigation and Drainage Law, and this also had the same luck This is a vivid demonstration of the need for a different approach The Environmental Commission of the National Assembly, all the institutions involved, and NGOs should be included in the analysis and drafting of the laws These drafts should then be discussed in a wider audience to reach a consensus, and finally presented to the National Assembly, through the Environmental Commission This is the procedure proposed by PROMESA

Wildland protection legislation This has also been identified as priority by SEMA in its "Agenda Ambiental y Plan de Acción," p 78 This piece of legislation will cover a void, as there is no legal structure for the protection of wildland areas

4 2 Outputs

The following outputs will be produced by the policy component of the Project

- Assistance to SEMA to develop certain components of the national environmental and NRM strategy,
- Assistance to SEMA to design a participatory system to analyze, formulate and monitor NR policy The major policies include
  - Environmental education,
  - Land use planning,
  - Natural resource policy to support sustainable agriculture production,
  - Incentives for conservation practices,
  - Role of the government and the private sector in NRM and policy,
  - Protection of wildland areas already designated by the Phase I agrarian reform cooperatives,
  - The agrarian debt The policy analysis will explore the possibility of swapping debt for investment in conservation and protection by the cooperatives themselves and small farmers in Phase III, Decree 207,
  - Debt-for-nature swaps,

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ENVIRONMENTAL EDUCATION IN EL SALVADOR: AN ASSESSMENT

Prepared under Contract:
PACA/CARE/USAID

Russell E. Davenport

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EXECUTIVE SUMMARY

El Salvador's treatment of its natural resources is undermining the population's future sustenance base, through rapid and accelerating depletion of the very resources on which the country's people and economy depend Severe, endemic conditions of uneven distribution of land and wealth have resulted in rural-to-urban migration, deteriorating social indices, political unrest and environmental degradation The resulting movement of poor populations onto small plots of ever poorer land, or into crowded urban squatter settlements, has created a vicious spiral of interdependent social, economic and ecological deterioration

The government of El Salvador believes that more and better environmental education will play a positive role in reversing the trend of ecological degradation Governmental institutions have been unable so far to take effective leadership in environmental education for a wide range of reasons, although this may change with the recently formed government office on the environment, SEMA, which includes environmental education as one of its priorities

For its part, the US government through USAID is launching a 7-year, $35 million natural resources management project called PROMESA, which among other things hopes to strengthen Salvadoran institutions to enable them to engage in effective environmental work

There has been proliferation of Salvadoran environmental non-governmental organizations (ENGOs) over the past few years, whose presence has been felt especially strongly among the urban middle class, as they have become more aware of the problem However, to date, they have little history of effective resource management, and little tradition of effective influence on policy

An assessment of environmental education in El Salvador was requested by USAID of PACA *(Proyecto Ambiental de Centro America)*, the Costa Rica-based Central America Environmental Project The primary purposes of this assessment were to determine what environmental education activities, resources and professions exist, which should be enhanced, and how

A broad, consultative process was designed to collect information and analysis from Salvadoran professionals in diverse fields related to environmental education Initial guiding definitions were developed after a first review

1 The primary functions of **education** are to provide information about alternatives available to people in order to improve their lives, and to provide concrete tools, skills and data that enhance their ability to take advantage of those options

2 One of the most important functions of **environmental education** is to provide the basic information people need to live with their environment in sound ways which protect their future

3 **Formal Education** encompasses all school programs carried out by the National Educational System, overseen by the Ministry of Education, including all public and private schools, technical schools and universities

4 **Informal Education** includes all activities directed to mass audiences and the general public The principal institutions which carry out informal environmental education are the communications media (radio, television and newspapers) and a variety of parks, recreational centers, natural areas, archaeological sites and cultural centers

5 **Non-Formal Education** refers to those processes which involve the active participation of specific, voluntary groups of targeted people Three kinds of institutions specialize in non-formal environmental education environmental NGOs (ENGOs), development NGOs (DNGOs), and some government offices and agencies whose primary mission is development or social services

Formal Education.

In El Salvador, private schools and universities at all levels must follow the same basic curriculum Environmental education is not a formal component in the Elementary and Junior High education curriculum, although some environmental components exist within the Nature Studies program No special texts exist In Senior High school, specializations begin to emerge, where the principal opportunity for ongoing environmental education is in the final year (grade 12) of a "Sciences" option of the Academic curriculum In other high school areas of specialization, only agriculture and health contain environmental subject matter

Higher Education includes university and non-university structures, where more opportunities for environmental specialties exist. Some of the specialized technical schools offer courses with environmental topics as part of required and elective courses, but no program has a single course on environmental science, ecology or natural resource management And no interdisciplinary programs or majors exist in this field

The University of El Salvador (UES), through its Biology Department within the School of Humanities, is training students in such topics as "Care of the Biological Environment," and "Conservation and Utilization of Natural Resources " But there are no specific objectives for an environmental education curriculum

In other parts of the university system, the UES Medical School includes specializations that indirectly include aspects of environmental issues The School of Agricultural Sciences has a major in agricultural engineering with a required course in ecology The Architecture Department of the School of Engineering and Architecture has a required course in Principles of Ecology The Chemistry and Pharmacy Department includes a course on environmental pollution and public health Students majoring in Humanities receive a basic introductory course in biology which has some ecological content. But there is little planning and no coordination in the development of these courses, and their quality and consistency are irregular

The curricula of private universities are based on government regulations and are similar to those of the UES Some have biology courses with practical training and field work in areas related to environmental issues, but none has a course or program in this field

The development of teachers in El Salvador has been in serious difficulty for some years, and training of new teachers is currently suspended as a result of political pressure and military priorities The Ministry of Education lacks effective administrative structures, while teachers lack books, manuals and other teaching tools However, some programs that showed promise before being suspended can serve as guides for future teacher training programs

International support consists of two programs The World Bank and UNICEF are supporting a four-year project called *Educación Infantil con Apoyo de la Comunidad* (EDUCO) USAID has established an eight-year program of curriculum reform for primary education and institutional restructuring, entitled "Strengthening Achievement through Basic Education" (SABE)

The assessment discovered that the educational system is not adequately serving the preschool and school-age population, with more than 500,000 children lacking any access to schooling Further, the Ministry of Education reports alarmingly high rates of grade repetitions and drop-outs at young ages Curriculum design problems are pervasive, while environmental education has generally not been incorporated into the objectives or curricular content of the school system Further, there is a lack of coordination between public and private institutions in designing environmental education materials

Nevertheless, there is growing interest outside the Ministry in curriculum reform that will increase the relevancy to people's lives of courses they are offered The existence and increase of environmental information scattered throughout a variety of courses is testimony to the appropriateness and possibly to the desire in diverse sectors to implement coordinated environmental education in the schools

Practical environmental education through the school system is most needed in rural communities where changes in behavior will have immediate environmental effect But fewer resources go to these schools, and fewer schools serve the rural student population

There is also a severe shortage of comprehensive natural resource management programs that integrate biological conservation with sustainable development Especially needed are programs that address regional and national environmental management issues, and that develop multidisciplinary pedagogical approaches appropriate to the students being taught and the environmental needs of the country

The assessment makes recommendations regarding the training of environmental educators by in-country short courses, and by on-site training approaches Pre-service and in-service teacher training is recommended Exchanges of Salvadoran faculty and professionals with other academic or professional institutions and programs outside the country are also mentioned

Development of materials, horizontal integration of subject matter, and participatory education methodology for teacher training are addressed Input into the SABE process is also urged

Informal Environmental Education in El Salvador is divided in the report into two parts that offered by physical sites where visitors learn by seeing, and that which is carried out through the communications media

The primary characteristic in common to public installations is the existence of a physical location or plant which is the basis of the educational resource These include national, municipal and urban parks, tourist centers, museums, a botanical garden, cultural centers, and the zoo The educational activities include nature interpretation (marked trails, guided tours), passive exhibits, multi-media presentations, written information, and public talks

None of the institutions reviewed currently has an environmental education program, and institutional commitment is generally lacking "Installed capacity" of funding and infrastructure for environmental education activities is almost entirely located in San Salvador However, the potential of several institutions is encouraging

There are people in each institution who want to play a larger role in nonformal education, and want to serve the public directly by providing information through channels they create themselves The assessment determined that their resources would be more efficiently utilized if they generate environmental information, develop teaching materials for school teachers and development organizations, and conduct workshops and short-courses in how to maximize participation and interest in the topics

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Five national daily newspapers and six television channels are based in San Salvador, and well over 40 radio stations broadcast throughout the country, owned by churches, private individuals, government and corporations Every environmental organization wishing to convey environmental messages to the general public thinks first of using the commercial communications media However, no systematic effort has been made by environmentalists to determine the degree of receptivity of the media to carrying such messages

There is currently a "window of opportunity" open in radio and newspapers especially A consistent pattern can be observed in El Salvador's primary media outlets they are open to more environmental information and closer relationships with environmental activists and organizations than they now have Nevertheless, no media outlets covered in this survey have a stated policy regarding environmental issues, and none has regular programs or sections dedicated to the subject.

Environmental organizations will have to learn to demonstrate to the media the "marketability" of their messages Currently, use of the communications media by environmentalists is inconsistent, few have a media program, and fewer still have a communications or media strategy

An important part of assisting these institutions will be strengthening their ability to develop outreach strategies, so that they can determine what they want and how to get it from the media as well as other channels Training will be needed in journalism and media affairs for both environmental and development organizations

Non-Formal Education:

A look at the range of organizations which engage in nonformal environmental education reveals two major categories of activity those directed at people's attitudes by means of presentations by outside professionals, and those directed at people's practices, by means of outside facilitation of participatory community organizing and extension

Environmental non-governmental organizations have been proliferating rapidly over the past five years, numbering over 30 by early 1992 They seem to be having some impact, if not on people's actions, at least in creating an atmosphere in which stronger government policies can be established, regulations can be created, and enforcement can have effect

The assessment surveyed 13 self-defined ENGOs that had some kind of structured programs or activities which could be considered educational They tend to specialize in changing people's attitudes by means of providing information Few engage systematically in direct and ongoing work with community groups Few are accustomed to determining priorities or making strategic program decisions Some specialize in public denunciations, and some in tree planting A few ENGOs seek to rescue and manage natural resources in specific geographical areas However, although soil conservation is generally recognized as the single most important environmental challenge in El Salvador, no environmental NGO has taken on this area Similarly, potable water is also a grave environmental problem which no ENGO addresses directly or strategically

All ENGOs consider environmental education to be a significant part of their work, but many assume that organizational self-promotion, information about their project activities, and the activities themselves, are all intrinsically educational

Relationships between ENGOs are addressed in the report, as are their priorities for external support. They place material inputs (vehicle, office equipment, etc) above personnel, and training is often overlooked

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Although only seven NGOs have legal status (*personería jurídica*), most have not found a lack of it to be a major obstacle to their functioning

Some of the most effective environmental education in El Salvador is being carried out by organizations which do not consider themselves primarily environmentalist, or whose founding purposes were not principally ecological Development and social organizations (DNGOs) that work with poor people to help them solve socio-economic problems are engaging in environmental work as part of their overall program to strengthen people's abilities to influence their surroundings and improve their quality of life and economic conditions They have discovered empirically the relationship between environmental deterioration and underdevelopment, and as a result have developed locally-focussed educational activities which are practical environmental intervention stategies, and which include education as part of the process

The assessment surveyed 17 such DNGOs whose programs include activities or projects which provide support related to changing resource management practices Nonformal environmental education was found to be most effective when it seeks a balance between natural resource management and sustainable resource use, and between human and environmental needs

The assessment concludes that environmental problems are inextricably linked to many economic and social problems that community organizations are trying to solve Environmental educational efforts should be part of a broader development process, should grow out of, rather than be inserted into, ongoing community efforts at self-improvement, and are far more effective than self-styled environmental specialists from the outside

Effective nonformal environmental education should promote development based on sound environmental mangement and conservation principles The challenge of nonformal environmental education is to harmonize economic and social development of communities with the maintenance of diverse, natural ecosystems

PROMESA has an opportunity to facilitate exchanges between grassroots DNGOs with community skills, and selected ENGOs which have the social sensitivity and technical knowledge to offer environmental information and focus However, PROMESA was not conceptualized through a widespread, public process, and its design is primarily in the hands of foreigners There is speculation in El Salvador about the role PROMESA will play in environmental education and in the political economy of the country There is some fear that PROMESA consultants will survey, analyze and create grand schemes, and then select a few "favorites" to receive most of the benefits

ENGOs, DNGOs and government agencies involved in nonformal environmental education do not communicate very much yet The assessment reveals a functional complementarity which would gain considerable value by collaboration Support from PROMESA and others should strengthen the institutions and their programs, and should encourage mutual collaboration between the different kinds of organizations

Criteria for inclusion of partner NGOs should include commitment to environmental concerns, demonstrated appreciation for the communities' perspectives and respect for the people, recognition that technology alone cannot solve problems, demonstrated ability to learn new educational techniques, and willingness and ability to learn from and teach others What is most needed is a balanced approach to establishing partnership relations, a sensitive ear to a variety of approaches, and flexible, creative and diversified funding patterns

PROFILE AND SELECTION OF POTENTIAL ACTION AREAS

This annex describes the general climatic and geophysical conditions of El Salvador, with more specific discussions of the coastal zone and the six candidate action areas (AAs). A more detailed description of the AA chosen for the start-up of PROMESA field activities follows, along with the reasons for selecting it.

El Salvador is located between 13° 09' - 14° 27' north latitude and 87° 41' - 90° 8' west longitude, thus placing the country in the exterior tropical zone under the influence of tradewind branches with E-NE headings. Climatic seasons are defined by precipitation, with a definite dry season from November to April, and a wet season from May to October. Yearly variation in temperatures does not usually exceed 10° C, with the hottest and most humid periods occurring during the wet-dry transition.

El Salvador's territorial waters belong exclusively to the Pacific Ocean; the country is separated from the Atlantic by Guatemala and Honduras. The coast experiences regular semi-diurnal tides of the mixed type, with mean amplitudes ranging from 1.59 m in Acajutla to 2.47 m in La Union, and mean sea levels ranging from 0.98 to 1.52 at the same locations (Lessman 1986).

In general terms, the "coast" is a belt of variable width between the ocean on one side and dry land on the other. El Salvador's "coastal zone" however, spans a much larger vertical landscape. It is delimited on the north by the main volcanic mountain range, 20-30 km inland, and in the south by the continental slope, which separates the Guatemala Trench from the 50-80 km wide continental shelf (see Figure 1). For the purposes of PROMESA, the upper limit of the coastal zone is set at the 700 m altitude line.

PROMESA action areas will consist of representative "slices" (transects) of coastal watersheds that debouche into virtually the last salvageable natural ecosystem remaining in the country -- the mangrove forests of the country's estuaries. The imminent peril of El Salvador's beleaguered mangrove/estuarine ecosystems is one of the major factors in the project's decision to take its "action" in the coastal zone. Another is the fact that -- with the bulk of development efforts in the country focused on reconstruction of the war-torn north -- the coastal zone and its delicate estuarine ecologies have received relatively little assistance. Yet the coast and its watersheds constitute nearly half the land area of the country.

Lessman (1986) recognizes five major features of the Salvadoran coast: the western, central, and eastern alluvial coastal plains; the coastal ranges that separate the alluvial plains (Sierra del Balsamo and Sierra del Jucuaran), the Conchagua volcano, and the volcanic islands of the Gulf of Fonseca; the coastal estuaries; the coastal escarpments formed by the coastal mountains; and the Gulf of Fonseca. The general physical definition of the PROMESA AAs or "slices" is determined by a mangrove/estuary subzone and the coastal plains and uplands of its associated watershed complex. Six such "slices" were considered for PROMESA action by the design team: Barra de Santiago, Barra Salada, Estero de Jaltepeque, Bahia de Jiquilisco East, Bahia de Jiquilisco West, and Golfo de Fonseca

Barra de Santiago

The Barra de Santiago watershed complex is located in Ahuachapan Department at the western extreme of El Salvador's coastline. The major rivers of this complex are, from west to east: Cara Sucia, Aguachapio, Guayapa, El Naranjo, El Diamonte, and El Rosario. All run north to south and are fed by the slopes leading down from the El Imposible National Park. Although these watersheds are relatively distinct, none is totally isolated from the others. Via canals, they directly or indirectly drain into the Pacific through the Barra de Santiago mangrove/estuary ecosystem. The watershed complex is bounded on the west by the Cara Sucia River watershed and on the east by the El Rosario River watershed. The Pacific Ocean marks the southern limits of the area; its northernmost extension is delimited by the break in the coast range watershed inside the boundaries of El Imposible National Park, some 1400 m at its highest point.

Most of this complex is classified as humid subtropical forest, hot subzone. This classification is representative of 85% of the country. Rainfall varies between 1400 and 2000 mm per year, distributed in a single six-month season. With more than 2000 mm of rain annually, the northern part of El Imposible park is classified as very humid subtropical forest. Six major land forms can be distinguished in the vertical landscape of Barra de Santiago (Figure 1).

1) First is the mangroye forest, which covers an area of approximately 21 km^2, and its associated estuarine subzone. The estuary's main channel is up to 500 m wide and extends about 500 m to the southeast from the inlet to Bajo de los Limones Island.
2) Between this subzone and highway CA2, lie approximately 33 km^2 of flat coastal plain composed of alluvial sediments and volcanic material, with wide beaches interrupted by estuary inlets.
3) Next are some 30 km^2 of lower river valleys, up to about 100 m.

4) In addition, riparian biomes parallel the river banks from the top of the watershed down to their alluvial plains.
5) Cultivated uplands extend to ca. 700 m, with an approximate area (horizontal distance) of 150 km^2.
6) Last are the hillside farms and the El Imposible parklands from 700 m up to the watershed divide at about 1400 m, with an approximate area (horizontal distance) of 32 km^2

The estuary subzone contains some patches of undisturbed mangroves, particularly away from the main channels. But increased cutting of mangroves for fuelwood plus the effects of hurricane Gilbert in 1982 have severely impacted other stands. Several mangrove replanting projects have been undertaken in the area with generally good success.

Agricultural regimes in the Barra de Santiago watershed complex predictably vary according to altitude, slope, and land tenure. They range from large scale plantations of cash crops such as sugarcane and coconuts on the coastal plain, through intensive cattle ranching in the plains and the foothills of the uplands, to mixed production of basic grains, legumes, and livestock (cattle, swine, poultry, some small ruminants) in the uplands. No soil and water conservation practices are evident in the region.

Barra Salada

This area lies at the eastern end of the occidental coastal plain, which ends with the Sierra del Balsamo immediately to the east. Materials for the formation and maintenance of the Barra Salada estuary are provided by the Mandinga and Pulaluya Rivers. The Banderas River bounds the estuary at the western end and has a considerable flow during the rainy season. There are more than 5 km^2 of mangroves extending for about 4 km inland near the littoral highway. The lagoon behind Barra Salada is approximately 1 km long and 400 m wide, with several sand islands. The Salina Ayacachapa salt pond is located inside the mangrove forest.

Agriculture on the Barra Salada's coastal plain features mango and citrus orchards and coconut plantations. Higher up, cane, corn, sorghum, beans, and (during the rainy season) rice are raised. Some non-traditional export crops are grown under irrigation. These include marigolds, cowpeas, and okra. Dual-purpose cattle are also raised in the area. Upland agriculture centers on household cultivation of basic grains, legumes, poultry, and some fruit crops.

Estero de Jaltepeque

The Jaltepeque estuary is located in the central coastal plain. Inland from the eastern end of the Sierra del Balsamo to the edge of the mangroves there is an alluvial plain divided by

the Lempa River. Jaltepeque lies to the west and Jiquilisco to the east side. The Jiboa River is west of the estuary, while the Lempa is east. The estuary is approximately 20 km long with widths varying between 400 and 1200 m. Water depths average 1.5-5 m, but the lower part of the main channel is deeper, reaching depths of 10 m. The width of the lagoon and mangrove forest varies between 1 and 6 km in the west and east, respectively. Of the multitude of islets within the estuary, the largest is Isla Tasajera (approximately 5 km^2). Through time, the estuary has alternated between being fed by the Lempa and Jiboa Rivers. Since 1951, increased flows of fresh water from the Jiboa into the western end of the estuary have resulted in other species' (notably *Ipomea* spp.) replacing some of the mangroves.

Crops (corn and cattle forage) are planted illegally in the mangrove areas. Shellfish traditionally harvested from the estuary have declined and do not provide the level of income to the mangrove dwellers they used to. Mangrove wood is used for fuel, fences, and construction. There is a big fuelwood demand in the coastal plain and the hills. Parts of Jaltepeque are visited by tourists, and the fuelwood demand is said to increase as tourism increases.

On the coastal plain above the mangroves, cotton, corn, and cattle are the main crops, along with some dairying and sugarcane. Non-traditional crops such as melons and papayas are reportedly difficult to grow because of lack of water and crop theft. Coconut and fruit trees are also raised in this area. Moving up the vertical landscape, next are small holdings on which livestock, sesame, cereals, and beans predominate. According to MAG extensionists, the hill farms are too low for quality coffee and too dry and small for traditional crop production. It is estimated that 60% of families in the area are landless except for their 500-1000 m^2 house plot. Since the peace accord, people have been flooding into the coastal plain and the uplands. Guerilla activity in Jaltepeque was apparently less than in the next two sites evaluated below.

Like Barra de Santiago, Jaltepeque has an active unit of MAG/DRN Forestry Division "guardabosques". In addition, MAG/CENDEPESCA reportedly maintains a fisheries lab and extension program, located about 7 km east of Zacatecoluca. At Comalapa, there is a plastic-sack nursery for eucalyptus, and reportedly FINATA has been active in some FIS-financed reforestation programs, as has also the Catholic Church in Zacatecoluca. The latter has a small nursery, primarily for fruit trees. AMAR is also operating in the Jaltepeque area, and other organizations have made efforts in forest gardens. And the upland farmers reportedly have some history of planting teak, guanecaste and citrus.

Bahia de Jiquilisco East and West

The Jiquilisco estuary lies between the Lempa River and the Sierra de Jucuaran. It covers some 400 km^2 extending along 55 km of coastline. The main channel (Jiquilisco Bay) is approximately 43 km long if one considers all the meanders. Widths of over 2 km occur along 30 of those, with a multitude of islands in the interior. The San Juan del Gozo Peninsula bounds most of the seaward edge of the estuary. The Bocana (inlet) El Bajon bounds the area to the east. There are approximately 19,000 km^2 of mangroves throughout the estuary.

Puerto El Triunfo is the largest port in the bay. About 30 large commercial fishing boats work from four piers here. A fishing cooperative is active in the area. There is a great deal of post wood for sale along the highway near this town. Puerto Parada is used by 50 or more small boats. No large vessels can reach this port because of the depth of the water. Salt beds are an important economic activity here. Puerto Avalos is a small, hard-to-reach port used by small boats. Mangroves in this area have been heavily cut. War damage to bridges, utility poles, houses, and other buildings is common along the road from Jiquilisco to Usulutan. Agricultural regimes are similar to those described for Jaltepeque. Areas abandoned during the war display considerable wild secondary growth, with pioneer legumes predominating.

The MAG maintains local offices in Jiquilisco and Puerto El Triunfo. It has built a fishing dock and it maintains a "Marine Institute" at Triunfo. There are about 80 ISTA cooperatives in the area, and Finateros are organized into 6-7 co-ops.

Golfo de Fonseca

A deep penetration of the Pacific Ocean into Central America forms the Gulf of Fonseca. The western shore belongs to El Salvador, the southeast entrance to Nicaragua, and the central shoreline to Honduras. This is a volcanic area, as exemplified by the Conchagua and Consiguina volcanoes and by the many volcanic islands that dot the gulf. The area contains important ports such as La Union and Cutuco on the El Salvador side. In 1977 approximately 4,720 ha of mangroves surrounded the Bay, but their present extent is unknown. Nevertheless, some areas are clearly deforested and badly require soil conservation. Much of the gulf region is occupied by small holdings devoted to corn, beans, sorghum, sesame, cashew, and citrus. There are some abandoned pastures and agricultural lands with potential for non-traditional crops if irrigated.

SELECTION OF ACTION AREAS

Based on site inspections, literature reviews, and interdisciplinary team and counterpart consultations, the Barra de Santiago watershed, and its subzones numbered 1 through 5 above, was selected as the start-up action area for PROMESA and its primary "showcase" site, for a variety of reasons.

First, this slice is compact, with clearly-delimited watersheds. Moreover, unlike some of the other AA candidates, its vertical landscape displays the entire spectrum of natural resource use possible within the Salvadoran coastal zone generally -- open-water estuary, mangrove forest, coastal plain, and uplands -- all in a relatively ordered and clearly delimited fashion. Thus, successful actions and "lessons learned" in Barra de Santiago will be readily identifiable in terms of subzone appropriateness and potential transferability to equivalent subzones throughout El Salvador's coastal zone.

Second are two further advantages: the Barra de Santiago's already high-profile position as a national beach resort, and the added media attention and public interest that future development of the El Imposible National Park has already begun to stimulate for this watershed complex. Such factors suggest opportunities for enterprises and education/outreach impacts beyond the immediate NRM actions of PROMESA alone, with hope of increased local enterprise development and sustained public interest and attention.

Third and relatedly, the area has a number of physiographic characteristics, such as islands and protected estuarine channels, that offer realistic possibilities for establishing alternate local sources of income and employment alone or in conjunction with biodiversity protection and future support and development from powerful international NGOs. Whether with direct or indirect PROMESA support, possibilities include: oyster and *curil (Anadara tuberculosa)* raising; iguana ranching; sea turtle management; and eco- and archaeological tourism associated, e.g., with preservation of exotic bird species and Maya ruins.

Fourth, an international ENGO will begin a biodiversity and socioeconomic inventory of parts of the watershed within a few months, thus supplying much-needed basic environmental data -- something that is woefully lacking for other sites.

Fifth, this slice has been least exposed to agrotoxins, since little cotton (the worst offender) was planted in the area in past.

Sixth, at least two national-level ENGOs are already active in the area -- AMAR in the mangrove/estuarine subzone with sea turtle protection and mangrove reforestation, and FESA in El

Imposible National Park with a variety of activities. In the uplands, a national agricultural credit association with 13,000 members has started to address deforestation and soil and water conservation issues. Last year it planted 5000 trees; with transport assistance, it hopes to plant some 50,000 more next year on lands it has already identified.

Seventh, fishers in the mangrove/estuarine subzone are acutely aware of their shrinking aquatic resources. These overexploited niches provide both need and opportunity for successful interventions In short, the institutional and sociocultural soil for AA interventions in Barra de Santiago is fertile, promising significant, positive environmental and economic impacts plus high-profile attention nationwide.

Some characteristics of the Barra de Santiago, however, are less attractive. For one, its proximity to the Guatemalan border may lay it open to extraneous influences (e.g., new in-migrants, fishers from other areas). Still, its most important watersheds lie completely within national territory. Perhaps a more serious consideration is the fact that agricultural and residential areas closely abut the remaining natural forests in many places They may present implementation problems in, e.g., establishing buffer zones. In addition, a significant population of war-displaced further stresses the area's natural resources and makes for a number of social, cultural, and economic unknowns in project design (see Social Soundness Analysis). It is at present impossible to say which or how many of these displaced persons will remain in the area instead of returning to their homelands. Furthermore, this population is foreign to the natural habitats and resources of the area. Thus, war settlers would require far greater technical instruction in management of local ecosystems Finally, resource tenure issues and landlessness pose some thorny issues for proposed project interventions in some groups and subzones. These issues, however, are common to the whole of El Salvador.

Despite these caveats, of all sites considered, the Barra de Santiago area possesses the best combination of attributes for implementing AA activities. Given the limited resources available across PROMESA's multiple components, the project will initially concentrate its efforts at one site and then extend actions as conditions warrant To do otherwise will result in a series of small, disjunct, and inconsequential efforts with little cumulative impact and negligible tangible benefits. Furthermore, this approach will facilitate project start-up and permit careful assessment of which activities are best suited for other areas.

No later than the midterm of the project and based upon on-going internal evaluation of PROMESA efforts in the Barra de Santiago, specific PROMESA activities will be extended to other subsites within this AA and, in a targeted fashion, to others of the sites evaluated. In the latter case, the Barra Salada is not

recommended. Despite its biophysical similarity to the Barra de Santiago, its small size severely constrains the types and extent of activities that could undertaken there. Conversely, the Gulf of Fonseca is very large and complex, and its habitat components are diffuse and not easily delimited. Moreover, it is subject to direct oceanic influences. Further complicating this site is the fact that it spans territorial waters of two countries (with the larger portion belonging to Honduras) that are engaged in an on-going dispute over frontiers. Such a site is best left to larger international cooperation efforts, for which there are several sources of possible support -- e.g., the GEF (Global Environmental Fund) and the UN Man and the Biosphere Program. However, some areas southwest of the gulf proper, such as El Tamarindo, might be suitable for extension of limited PROMESA activities

Perhaps the best choices for extension of selected project activities are the Jaltepeque and Jiquilisco estuaries. They offer many opportunities for interventions. And like Barra de Santiago, in Jiquilisco some Salvadoran NGOs have worked successfully with local organizations to reforest mangroves and restore fisheries industries. However, integration of estuary/plain/upland activities will be more difficult for Jaltepeque and Jiquilisco because of these subzones' diffuse spread across the landscape; i.e. there are no natural subdivisions within large areas. Also, water control structures of the Lempa river influence water flow patterns in parts of both estuaries. Additional characteristics of these sites represent a mix of both problems and opportunities. They display the gamut of mangrove statuses, from complete destruction of parts of the forest, through significant secondary regrowth in some of the areas that were abandoned during the war, to some relatively undisturbed areas. Certain locales, e.g. parts of San Juan del Gozo peninsula, are sparsely populated. In more remote areas, poverty is extreme.

FORESTRY AND AGROFORESTRY TECHNICAL ANALYSIS

I. INTRODUCTION

Some of the socioeconomic and ecological conditions prevalent in the coastal regions of El Salvador require solutions based on the introduction of trees, and trees in association with crops and soil and water conservation (SWC) practices. The problem faced by the Government, the NGOs, the people of El Salvador, and in particular by the PROMESA team, is how to define and implement these solutions in an appropriate and sustainable way.

This annex has as its principle objective a discussion of possible forestry and agroforestry measures that could be used in the PROMESA action areas (AA), taking the start-up AA of Barra de Santiago as a representative unit of analysis. Some of the major forestry and agroforestry projects undertaken in El Salvador are briefly mentioned as background and examples. This list of projects is not complete, as there are probably many smaller projects implemented throughout the country. Most of the annex is a listing of forestry and agroforestry techniques that serve as a menu for implementation. This is followed by a set of criteria used to chose the appropriate techniques, and finally a section on the details of field implementation.

A. Development of Forestry Activities in El Salvador

Forestry development in El Salvador since the creation of the forestry section in MAG in 1951 is described very concisely by Tschinkel and Guillen (1991). They define it in four stages as follows:

1) Reforestation of state lands in the north from 1951 to 1961. No significant results were derived from this activity, and tree survival was only 5%.

2) Seedling distribution by the Government from 1970 through 1984 was carried out by three different methods. Licenses were given to people to cut trees, but farmers issued licenses were given ten seedlings to replant. This scheme did not work because the farmers did not plant the seedlings according to plan. From 1974 to 1977, 15 million seedlings, mainly pine, teak and laurel, were produced by the Government at a cost of 0.27 colones/seedling. Some were sold at 0.06 colones and some were given away. Fifty-four percent were lost. From 1973 to 1976 the forest service undertook a watershed project in the north and east of the country. Only 10% of the number of trees programmed were planted. By 1978, 5792 hectares of land had been reforested by the state and private organizations. The war had the effect

of relaxing the pressure on the forest resource in the north and east and redirecting it to the west and central regions of the country, especially on remnant forests near population centers.

3) The ORE/MAG/AID project from 1981 to 1984. The goal was to reforest 37,000 hectares of land on 100 large ISTA cooperatives. Over 20 tree species were tried, but preference was given to pine and teak. Workers were paid for planting; 75% were cooperative workers and 25% were displaced people. Of 10,000 hectares of trees planted, 7,000 were lost. The main problems cited were over-ambitious goals, emphasis on tree species with high mortality, administrative problems that delayed delivery of materials, too little money allotted for maintenance of tree plantations, the perception by cooperative members that the trees were the property of the state, and the competition for space with traditional crops. Positive results were that some stands of trees still exist and are being used, and many farmers and technicians were trained in tree culture.

4) The MAG community nursery program from 1984 to 1991. This began with one community nursery in 1984 and has expanded to 265 nurseries in 1991, having produced 5.3 million trees. Each nursery produces 4000 to 6000 trees and distributes 200 to 300 plants per farmer. The most common species is Eucalyptus camaldulensis, which is grown for timber and posts. Fuelwood is taken as a by-product. The program started by using food for work, but now community groups volunteer their participation. No data were given on tree survival. The original request to MAG for technical assistance originated in a community group. Tschinkel and Guillen consider the project a success, and are requesting continuation.

5) Projects implemented by private organizations. Extension agents we have interviewed say churches have little potential for natural resource activities because they have other priorities. However, the Catholic church in Zacatecoluca is active in reforestation. The priest, Father Julio, said the church has a small tree nursery, and gives seedlings (mainly fruit species) to farmers. Cigarria Morazon has sponsored and planted forestry "gardens", or small demonstration plantations, each about 300-500 m^2. One is located about km 16 on the Comalapa highway. Prensa Grafica has an agriculture/natural resources newsletter, and AMAR is planting mangroves in the coastal area. Save the Children has been planting neem trees in the eastern part of the country. The Instituto San Andres is a private school with a reforestation program. Each student must promote the planting of 300 trees per year from the nursery maintained by the school. CEDRO, a development NGO working with 27 rural communities, has planted 80 ha of mangroves in Jiquilisco with fishers. The mangrove planters were paid wages for the work. Survival was good, but could have been better had the planters shared their knowledge of a snail that is known to feed on mangroves.

The conclusions to be drawn from these forestry projects are that participants should be true partners in the process, and that provision must be made for an extension system that interacts with farmers during the maintenance and harvest phase of tree culture. Interventions must address needs of the farmers and produce a relatively short term economic return. Also, the legal relationship between the trees and the tree planters must be very clear. These points will govern the tree planting activities undertaken by PROMESA.

B. Development of Agroforestry Activities in El Salvador

Only two well-known projects are discussed below. Field visits to the implementing sites show that farmers are participating for two principle reasons. The first is the advancement of credit or disbursal of agricultural inputs as incentives. Farmers in El Salvador use expensive agrochemical inputs and have a cash flow problem, which is why the incentives are welcomed The second is that the improvement in water harvesting due to the installation of soil conservation structures allows the farmer to plant high-value crops such as pineapple and bananas, having a short term return. The effects on soil conservation are important, but from the farmer's point of view they are not the primary reason that techniques are adopted.

1) PNUD/FAO/MAG "Apoyo Agroforestal a Comunidades Rurales de Escasos Recursos." This project began in 1980 in Chalatenango as the first phase of a pilot project. The second phase will end in 1992 after expanding into Usulutan and Morazan. The project works with groups and individuals promoting conservation and crop diversity. The engine enabling the success of the project (158 rural communities reached, 3100 ha of SWC practices since 1987) is the credit in kind given to participating farmers. Extension agents determine the appropriate practices with the farmers, and inputs are advanced when 60% of the required SWC practices are installed on the plot. The field installations are impressive, but the cost to MAG of managing the credit is high.

2) CEL/MAG/CATIE/ROCAP "Rehabilitacion de la Subcuenca del Rio Las Cuencas." This project works on a watershed important to the supply of water to San Salvador. Therefore the level of subsidies are justifiably greater than grassroots community based agroforestry. The principle activities are tree planting (20,000), SWC structures in cropped areas, on-farm ravine control structures with vegetative barriers, permanent gabion controls in the larger ravines, and Lorena stoves. Extension agents actively participate during installation of structures. One farmer interviewed did not know how to calculate the distance between infiltration canals installed on his farm, presumably because the extension agents had done that part of the work without transmitting the methodology to the farmer.

These two projects are considered to be successful by most people. Lessons for PROMESA are. farmers respond to credit and subsidies; and in order to design an approach with widespread applicability, incentives must be provided at a much lower cost.

II. CONSTRAINTS TO AGROFORESTRY AND FORESTRY IN THE START-UP ACTION AREA

A. Location, limits and description of the action area

The region proposed as the first action area is located in the department of Ahuachapan, at the western extreme of coastal El Salvador. The area is bounded on the west by the Cara Sucia River watershed, on the east by the El Rosario River watershed, on the south by the Pacific Ocean, and on the north by the break in the coast range watershed inside the boundaries of El Imposible Park, about 1400 m above sea level at the highest point. The rivers contained within the area run north to south, are fed by the slopes coming down from El Imposible Park, and pass through the mangrove ecosystem known as La Barra de Santiago via canals into the ocean. The major rivers are, from west to east: Cara Sucia, Aguachapio, Guayapa, El Naranjo, El Diamonte, and El Rosario. There are also several smaller streams.

Most of the selected action area is classified as humid subtropical forest, hot subzone. This classification is representative of 85% of the country. Rainfall is from 1400 to 2000 mm per year, distributed in a single six-month season. The northern part of the area in the El Imposible park is classified as very humid subtropical forest, having more than 2000 mm of rainfall annually (Moran et al, 1985). There are six major kinds of land forms contained in the area:

1) The Barra de Santiago mangrove forest has an area of approximately 21 km^2; 2) The flat coastal plain between highway CA2 and the mangrove forest has an area of approximately 33 $km^2$2\; 3) the lower river valleys up to about 100 m elevation have an area of approximately 30 km^2; 4) the riparian zones running immediately adjacent to the rivers from the top of the watershed down to their alluvial plains; 5) the cultivated hill lands running up to about 700 m above sea level have an approximate area (horizontal distance) of 150 km^2; and 6) the hill farms and El Imposible Park lands from 700 m up to the watershed divide at about 1400 m elevation have an approximate area (horizontal distance) of 32 km^2. The actual El Imposible Park boundaries are not found on the 1:25,000 topographic maps, and the boundaries between the park and cultivated lands vary in their elevation. A more complete description of the AA is given in Annex {}, Profile and Selection of Potential Action Areas.

B. Institutional Constraints

Institutions should be in place that provide access to knowledge about forestry and agroforestry practices, a source of plant material, a mechanism for delivering knowledge and material, and a system of extension capable of working with groups of farmers in the field. For the majority of Salvadoran farmers, these institutions do not exist.

There is no forestry/agroforestry program adequate to meet the needs of the people living in the AA selected for project start-up. MAG facilities and staff are not sufficient for the task. Policy is in place to protect existing mangrove forests in the estuary and the El Imposible park. But policies are not enforced properly both because institutions are weak and because alternative sources of the tree products are not available. When enforcement does take place in the park, the guards "levantan una acta" against the offender, but nothing ever comes of this (Juanmarco Alvarez, pers com.).

C. Ecological Constraints

In the estuary, mangrove areas that have been harvested should be replanted with mangroves in order to protect the unique estuarial system. But some of the former mangrove sites may have been changed by cutting so that mangroves will no longer grow. A survey of mangrove sites is required in order to calculate the amount of reforestation needed, locate the best sources of seed for the different species, and assess the condition of areas to be replanted. We must also assume that the best trees have been cut, leaving the less productive trees as seed sources. This may require the introduction of seeds from outside the region in order to improve the genetic base of the mangrove forest.

In El Imposible Park, a possible strategy to provide alternatives to farmers harvesting trees is to bring species from the park into the farming systems. In order to do this, knowledge of what species are used, where they are located in the park, when seeds are produced and how to grow these trees and shrubs in nurseries is required. An inventory of tree species has been made, and a study of the phenology of some species begun (Maria Luisa Reyna de Aguilar, SEMA, pers. com.). However, some park resources will never be able to be installed on farms because of the different environment, so the park will always be a resource for people.

D. Socioeconomic Constraints

The people cutting the mangroves do not have alternative sources of fuelwood. Many of the mangrove cutters are landless, so any alternative involving woodlots is not viable for them unless policy changes permit creative solutions. On the coastal plain there are significant areas of unimproved pastures that could be converted to woodlots. If these are to be alternative

sources of fuel and construction wood for cooperative members, we need to know how resources held in common are allocated within the cooperatives. Mangrove cutting is done by individuals, as opposed to coops as a common venture. Any benefits from woodlot production must therefore accrue to individuals if mangrove destruction is to stop.

On the hill farms of the coastal uplands, it appears that soil and water conservation will be successful only if farmers are able to add some higher-value crops to the system. Inputs and SWC are both expensive. However, bad roads discourage delivery of higher-value crops to market. Other constraints are that water is limiting in the dry season; and steep slopes require soil conservation measures to conserve water, stabilize soil, and conserve the agrochemicals applied to crops.

E. Policy Constraints

Two alternatives for the mangrove area will require policy negotiations with the GOES. One involves recovering the strip of land between the cooperatives and the mangroves where trees have been cut and squatters have subsequently settled. The squatters could be given the title to the land on the condition that they replant and care for an area of mangroves adjacent to the plot, and plant a buffer strip of trees on a part of the land awarded to them. The other alternative is to link oyster culture in the estuary with usufruct rights and responsibilities in adjacent mangroves. This is discussed in the Social Soundness Analysis and the Mangrove Estuary Resource Management technical analysis.

Alternative woodlots on co-op lands could be profitable if the mangrove cutting ban were enforced. A plan is needed for phasing in the enforcement as woodlots mature to harvest age.

As with the mangroves, the process of establishing alternatives to park resources, while at the same time rigidly enforcing park boundaries, must happen in a planned and coordinated way. The Park Service controls El Imposible Park that abuts private and cooperative holdings on the coastal uplands. Substantial areas just north and south of the park are being discussed by FESA as areas to be purchased when funds are available. When purchase is complete they will be converted to forest (Juanmarco Alvarez, pers. com.). These lands are candidates for a taungya reforestation scheme, whereby farmers are awarded temporary cropping privileges in return for planting trees. This will require the establishment of a clear policy for reforestation, and perhaps usufruct rights to resources in the buffer areas.

III. INSTITUTIONAL SETTING IN THE ACTION AREA

The mangrove forests and estuaries belong to the state, represented by the MAG and CENDEPESCA. Some cooperatives abut

the mangrove areas. The co-ops either own a portion of mangrove lands or they commonly cut mangroves for fuel. AMAR is doing mangrove planting and sea turtle culture in La Barra de Santiago

The ISTA cooperatives are the dominant institutions operating on the coastal plain. They plant both traditional and export crops, and several receive technical assistance from the AID-funded CLUSA project. Seven of the cooperatives have associated in a group called 4A, and are interested in tree planting activities. They have a small plastic sack nursery located at the Cara Sucia cooperative. There is a credit association called ANACS that has an office in Cara Sucia, and appears to be associated with ARENA. They claim to have 13,000 members nationwide.

The coastal uplands appear to be the area least served by extension services. There are some large co-ops but small landowners predominate. Churches as agents of agroforestry development have potential for this area. FUCRIDES, a private organization associated with the Catholic Church, gives credit for fertilizer in 16 local communities in or near the action area. The director of FUCRIDES is an agroforester.

El Imposible Park is governed by the National Park Service, which has given a management contract to FESA. SEMA has done a species inventory and is doing a phenological study of some of the species, as mentioned above.

IV. PROPOSED PROJECT ACTIONS

The PROMESA team will help farmers in the Action Areas (AAs) implement these practices by working through local NGOs selected on the basis of their commitment to the region, relationships with the farming community, and ability to manage a natural resource program.

A two-level implementation structure will be created to reach farmers. The PROMESA AA team represents the first level. The team will be based in the AA, and will include a regional team leader, a forestry/agroforestry specialist, an estuary specialist, and technicians working under the supervision of each specialist. PROMESA will help the participating NGOs to choose rural "action agents" from among the farmers residing in the particular areas where field activities will be done. The NGOs and their action agents represent the second level They will be part-time employees of their NGO, not of PROMESA. Each action agent will be expected to participate in training exercises and rural appraisals, install selected SWC practices on his/her own land as a model garden, and then work with 20 to 30 neighboring farmers each year in SWC activities.

PROMESA will try to concentrate its activities within sub-watersheds in the AA, and will negotiate with the participating

NGOs to that end. Some of the NGO's will construct tree nurseries (both plastic sack and small container) with the help of PROMESA. This is a list of proposed actions appropriate for the flat and gently sloping lands between the mangroves and the coastal hills, and for the hillside farms up to the park boundary. These are only potential actions until the project team conducts in-depth consultations at project start-up with implementing institutions and participating farmers. A list of selection criteria is given, followed by a description of each action.

The following criteria will be applied to the list of candidate actions:

- Does the action provide a product of interest to the farmer? Short term returns are assumed to be preferred to long term returns.

- Does the action mitigate constraints to farm production in ways that are acceptable to the distribution of labor and benefits within the farm family and the rural community?

- Can the farmer afford the cost of installation, maintenance and harvest - both total cost and cash flow before the payoff? Can the farmer sustain these costs after EOP?

- Does the action mitigate environmental degradation?

- Does the action provide an alternative to the use of resources found in the El Imposible park or the mangroves?

- Is the action based on a technology proven in El Salvador or elsewhere in Central America?

These criteria will be applied by the PROMESA field team in collaboration with implementing NGOs and farmers during participatory rural assessment exercises. Since the assessment exercises will be collaborative, it is likely that the list of criteria will be modified during the process. A forestry or agroforestry technique should satisfy as many of the criteria as possible in order to be selected. The effects of each action on the environment, and any mitigating actions required to overcome negative effects, are discussed in the Environmental Assessment annex.

1. Woodlots

Woodlots are proposed as an alternative to the cutting of mangroves for fuel and other uses. The mangroves in La Barra de Santiago are being cut primarily for fuelwood. Mangrove wood is an excellent fuel and a construction timber resistant to decay. These properties should be duplicated in some of the species selected for planting in woodlots, if the woodlots are to be successful as an alternative. At least two groups could benefit

from planting woodlots: the Finateros, who have title to their land, and the cooperatives that have land on the coastal plain adjacent to the mangroves. There are also some larger privately held lands where woodlots could be planted. The woodlots to be planted with the coops and private landowners in the hills above the coastal plain will serve the same functions and have the same environmental effects as those on the plain, with the additional SWC benefit derived from the leaf litter and tree canopy covering steep slopes. Hillside farms are mostly owned by the farmers, so the woodlots will probably be smaller. Because the hillside farms continue up to the border of the El Imposible Park, hillside woodlots can also become an alternative to cutting trees in the park. To that end, as many of the indigenous tree species as possible will be used in hillside woodlots. In addition to solid blocks of trees, many farmers may be more interested in rows of trees on the contour at wide spaces in cropped areas. Only limited soil conservation effects are expected from this configuration since litter does not accumulate.

PROMESA will consult with farmers regarding species, obtain seed according to the quantity and species desired, train NGOs and farmers to raise the seedlings in nurseries, train farmers in site preparation and maintenance via action agents, ensure that the trees are distributed and planted in a timely fashion, ensure that post-planting maintenance is performed, and monitor the survival and development of the trees and the extension process.

Selection of species: Information exists regarding selection of fast-growing tropical hardwood species appropriate for El Salvador. Trial results from the Madelena series of studies has been published by CATIE (Campos et al, 1989; Franco et al, 1989; Hernandez, 1990; Hernandez et al, 1990; Navarete et al, 1990; Zambrana et al, 1990) indicating that Eucalyptus camaldulensis, Gliricidia sepium, Tectona grandis, Leucaena leucocephala, and Cassia siamea should be considered. Plantations of neem (Azadirachta indica) should also be discussed with farmers as neem has insecticidal properties, and can replace some chemical pesticides. Commercial processing of neem extract is beginning in the U.S., so possibilities for export also exist Save the Children has planted neem in the eastern part of El Salvador (Modesto Juarez, pers. com.), and these plantations might serve as a source of growth information and seed. In addition to these species, other indigenous species may be more appropriate from farmers' point of view, and these will be chosen as the project begins. One of the major considerations in species selection will be the ability to exclude animals from the area during the time when crops are absent. If the plantation cannot be fenced against animal damage, non-palatable species (e.g., eucalyptus, neem) will be recommended.

Installation of nurseries: Two kinds of nurseries will be used. Local NGOs distributing a relatively large number of seedlings will have central nurseries on property controlled by the NGO. If transportation to the planting site is not difficult,

plastic bag seedlings can be produced. If there is a problem transporting seedlings to the site, we should consider small container technology such as the Spencer-Lemaire Rootrainer or direct seeding for appropriate species. One group of seven cooperatives served by the CLUSA project has already installed a sack nursery on the Cara Sucia cooperative, and has selected locations for outplanting. This nursery is a good beginning but needs some training in order to become more efficient. The other kind of nursery is the individual plastic sack nursery installed by farmers near the intended planting site.

Site preparation and planting: Plastic sack trees are planted by opening a hole large enough for the rootball and soil in the sack. Weeding is either done around each hole or, if the trees are to be planted in cropped land, the weeding done for the crops will be sufficient for the trees. The seedling is removed from the bag, placed in the hole at the level of the root collar, and soil is packed around the roots. Planting should be done at the beginning of the rainy season, although farmers having individual sack nurseries are more likely to plant a few at a time when labor demands for other activities allow Site preparation is done just before planting, although if the plantation is a large one it is better to mark the tree positions and weed the site before the rains begin.

Plantation maintenance and tree management: Maintenance activities include weeding, replanting to compensate for mortality, and excluding animals from palatable species. Management can include pruning for form, thinning, periodic and final harvesting, and management of the coppice for species that resprout after cutting. These activities vary according to the species and product desired. Small farmers often manage according to immediate needs for cash or tree products rather than according to the optimum silvicultural schedule for producing the maximum amount of wood.

Scope of the action, timing and sequence: The first planting season for which seedlings will be needed under PROMESA is the May 1993 season. The number of trees required will be determined by action agents working for participating NGO's. In the case of large cooperative plantations the number of trees is a function of the space available for planting and the spacing of the trees. This number will be determined by the PROMESA staff in consultation with the cooperative. Small farmers can either produce the trees they need or have trees delivered to them from a group nursery. Action agents working for the NGO producing the trees contact the farmers before the nursery season, visit the intended plantation site, estimate the number of trees required by species, and report this number to the nursery. During the first year PROMESA should develop only one or two tree nurseries with NGOs in order to learn from the process and develop the model. The seedlings can be planted on cooperative lands and delivered to private landowners with plots on the flat lands. The number to be produced should be 20,000 in plastic sacks, and

50,000 in Spencer-Lemaire rootrainers to see if small container technology will work in the PROMESA action area At an average of 2500 trees/ hectare, this will reforest 8 hectares with plastic sack seedlings and 20 hectares with small container seedlings. The majority of the trees will probably be planted on cooperative land in unimproved pasture. As many Finateros as possible will be inscribed by action agents working for PROMESA. These are individual landowners whose plantations will vary in size. Other private landowners on the plain who are immediately ready to either produce their own seedlings or plant trees by direct seeding will also be participants during the first year The nursery production cycle should begin in January with the preparation of the nursery area and materials, and ensuring a supply of seed.

2. Living fences and improved management of existing living fences

Improved management of living fences could supply another source of fuelwood and posts to serve as alternatives to mangrove cutting. Living fences of Gliricidia sepium, Erythrina, and other species are commonly used by the smaller landowners in the coastal plain. The fences are constructed by planting stem and branch cuttings of trees in the soil, which later sprout and root. Barbed wire is attached to the posts. The advantages are that it is cheaper than concrete posts, live wood does not rot in the ground, and the coppice wood can be managed for posts, fuelwood, and forage. The disadvantage is that the posts increase in size as they grow and surround the wire with new wood, occasionally breaking the wire. CATIE has done research on the management of living fences to maximize the productivity of the system. PROMESA action will be to examine living fence management to see if pole, fuelwood and forage productivity is limited by lack of management skills or by availability of appropriate germplasm. If productivity is limited, PROMESA will introduce appropriate germplasm and be a channel for new management techniques. It is not possible to quantify the action before surveying the farms on the coastal plain. The timing of cutting and planting the fence posts varies according to the species. Local farmers usually have that knowledge, and also know the size of material to cut in order to have the best chance of sending down roots and producing shoots Harvest is according to need, and can be done throughout the year

3. Alley cropping

Alley cropping consists of planting rows of leguminous trees in a cropped field. The goal is to produce nitrogen rich leaf material that acts as a mulch or green manure for the adjacent crops, reducing the need to purchase chemical fertilizer. This system can be managed for poles and animal fodder as well. The procedure is to delimit the rows according to the expected

production of leaf biomass and the need of the farmer for crop space. The alleys are planted in single or double rows, usually by direct seeding. After the seedlings grow large enough to have a strong root system, the tops are pruned in order to reduce moisture, light and nutrient competition with the crop plants. The leaf biomass is either placed between the rows of crops as a mulch, incorporated into the soil as green manure, or taken off as forage. IITA in Nigeria has published research results on alley cropping showing that it can sustain maize production in certain cases. Alley cropping can also be used in conjunction with chemical fertilizers, in which case the deeper roots of the trees can capture fertilizer leached into the soil out of reach of crop plants. That fertilizer is later captured by the crop plants from the leaf mulch of the trees. Small-scale trials of alley cropping have been done in Las Cabanas under the PNUD/FAO/MAG project.

The same comments apply on the hillside farms as for the coastal plain, with the exception that the slope is now a factor. Alley cropping is not in itself a soil conservation activity, even though hillside alleys are installed on the contour The trees are planted with a space of about 50 cm between trees in the alleys, so water and soil can flow through the bases of the trees. The leaf material applied as a mulch, however can now have some effect on soil erosion by covering bare soil. A better choice when the slope is above 15% is hedgerows, discussed below.

4. Windbreaks

Windbreaks consist of vegetative barriers, usually trees and shrubs, planted in rows along the edges of cropped land with the objective of reducing wind speed and subsequent airborne soil erosion and sometimes damage to crops. Usually two or three different species of different height are used together in the windbreak. The objective is not to completely stop the passage of air, but to reduce it so that minimal damage to crops occurs. Trees in the windbreak can be managed for timber, fuel and forage. There is a potential for planting trees in windbreaks on the coastal plain on cooperative lands and other holdings where export crops are grown. If enough contiguous plots have windbreaks, as in coffee culture on steep slopes, the soil conservation effect can be significant.

5. Hedgerows of tree species

Hedgerows are rows of trees (usually leguminous) planted at dense within-row spacing on the contour of sloped land for the purposes of soil conservation. They produce fuel and fodder, and increase production of adjacent crops because of increased soil moisture and nutrients. Hedgerows are installed by tracing a line of stakes on the contour in a cropped area with an A-frame level. A hoe or pick is used to make a narrow terrace (20-30 cm wide) along the staked row. Seeds of Leucaena leucocephala, Gliricidia sepium, Calliandra callothyrsus or another appropriate

species are planted in the soil of the terrace at a spacing of 5 - 10 cm between seeds. The seedlings are allowed to grow until a strong root system develops, about 18 months for the faster species, or when they are 2.5 - 3 m high. Then the tops are pruned off, leaving the stumps about 50 cm in height, and the leaves are separated from the woody part of the pruned stem. Maximum soil conservation is attained if the woody stems are placed just uphill of the stumps in order to block breaches in the hedgerow, and the leaves are spread out on the ground as nitrogen-rich mulch for the adjacent crops. Alternatively, the woody material can be used for fuel or poles, and the leafy material can be used as animal feed, especially in the dry season when feed is scarce. The distance between hedgerows varies with the slope and the needs of the farmer to maximize the area occupied by crops. A vertical distance of 1 m between hedgerows is a general way to calculate distance on the slope. As the tops of the pruned hedges resprout, they are cut back to the same stump height to reduce competition with adjacent crops and to provide the woody and leaf material. Crops are planted on the contour between the hedgerows. As normal cultivation occurs on the slope, soil accumulates on the uphill side of the trees, and over the seasons a bench terrace begins to form without additional effort on the part of the farmer. Hedgerows can be made of other plant materials, such as pineapples and grasses, but is rare that this is done alone. Usually they are planted in association with an infiltration ditch on the contour, and this is discussed in the section on watershed management.

WATERSHED MANAGEMENT TECHNICAL ANALYSIS

I. INTRODUCTION

The objective of this annex is to explain the watershed management component of PROMESA, that covers soil and water conservation (SWC) activities appropriate for slopes of 15% or greater Agroforestry techniques -- some of which are also soil and water conservation techniques -- are discussed in the Forestry and Agroforestry Technical Analysis.

Various watershed management activities have been carried out in El Salvador for long time. Unfortunately there has not been enough support to expand activities to the degree merited in a country in which one watershed (Lempa River) drains approximately 50% of the total land mass. Recently watershed management has regained attention due to:

- increased frequency and intensity of flash flooding during the rainy season;
- serious reduction of the amount of water in rivers during the dry season;
- accelerated erosion of hillside farms and subsequent loss of soil fertility and increased sediment loads in rivers and estuaries;
- loss of natural vegetative cover, in some cases irreversible, and
- poor water quality.

Moreover, watershed degradation is increasing because population pressure forces farm families to cultivate fragile hillsides with poor, shallow soils that lose productivity as erosion increases. The result is a cycle of low production and productivity. Most farmers in upper watersheds plant basic grains for home consumption. Their traditional production system produces average yields (country-wide) for maize and beans of 32 qq/mz and 16 qq/mz, respectively. Inefficient cultivation leads to soil erosion. Overgrazing interferes with natural regrowth of pasture and forest, which further increases soil erosion.

The small hillside farmer has traditionally received very little assistance from the public and private sector, due primarily to the remoteness and low perceived economic contribution of hillside farms to the agricultural sector. Experiences in some areas of El Salvador (e.g. Río Las Cañas, Tamulasco) have demonstrated that most of the country's hillside farms have a significant potential for increasing production (two or three times) and for becoming sustainable, resource-conserving systems. If sustainable production were to be achieved by a significant number of farmers, erosion on the surrounding areas

would decrease and the economy of the area under treatment would be strengthened.

II. WATERSHED MANAGEMENT APPROACH IN THE ACTION AREA

Watershed rehabilitation consists of field actions designed to restore degraded areas or to slow degradation in process. Rehabilitation requires the development of sustainable agricultural practices with farmers. This will be carried out by the PROMESA field team in the AA through local and national NGOs, and the collaboration of government agencies.

PROMESA watershed management practices will address the problems of hillside agriculture. This is because there is little possibility of establishing new reserves (e.g. El Imposible) within the AAs, and because reserved areas do not occupy a significant amount of land. The most efficient way the project can improve the natural resources of upper watersheds is to stabilize the main source of sediment, hillside agriculture. PROMESA field activities will begin in the Barra de Santiago AA (see the annex entitled "Profile and Selection of Potential Action Areas"). The broken topography of the upper watershed in this AA has slopes ranging from 15% to 100%. It is possible to find cultivated land with slopes greater than 100%.

The hillside farm system includes agriculture, forestry, small stock, and cattle. Farmers sell their labor to supply their needs and to reduce risk. Women are often seasonal heads of household when men leave to work off farm. PROMESA will make a special effort to include women in the extension of field activities.

Hillside farmers are usually geographically isolated. Limited access to markets makes it difficult to justify expanding or diversifying their production. Isolation also increases the cost of non-locally available inputs as well as extension services (public or private).

Average precipitation in the upper watershed ranges from 1600-2200 mm/year, concentrated from May to October. The rainy season is driven by the Intertropical Convergency (ITC) that moves to the Central American region from the equator. Storms are of high intensity with large raindrops. Erosive capacity of the storms is especially great during the first two months of rain because the vegetative cover is sparse after the long dry season.

In Barra de Santiago as well as in the rest of the AAs, there are many reasons for watershed degradation.

- Changes in land use from natural vegetation to commercial and subsistence crops or livestock without the proper conservation measures to reduce or mitigate soil loss.

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- Sediment flow to the estuary due to land use changes in the sloped areas of the watershed.

- Cultivation of inappropriate areas.

III. CONSTRAINTS

Small farmers face many institutional and socioeconomic constraints. These will be considered as the PROMESA team attempts to moderate destructive NRM practices.

Institutional Constraints

Both public and private organizations intervene in rural areas. The impact of their interventions is perhaps a fraction of what it might be, mainly due to inadequate financial support and failure to focus on specific areas. The most important institutional constraints include the following.

- Weak or non-existent local NGOs.
- Weak or narrowly focused national NGOs.
- Lack of capacity to enforce existing regulations.
- Non-existent avenues for information transfer. E.g., MAG currently does not have the capacity to provide the required technical assistance to most hillside farmers.
- Over-emphasis on technology *per se* without consideration of the social milieu.
- Lack of consideration of local resource users by policy-makers at the national level.
- Weak government infrastructure for addressing environmental issues at local and national levels.
- Application of inappropriate technologies.
- Lack of institutional experience in community participation in development.

Socioeconomic and Cultural Constraints

There are few viable mechanisms in El Salvador to define development program priorities and implement actions with community participation. Such mechanisms are necessary if the country is to recover from its irrational resource use. The behavior of communities and households toward resource use, and the approach and role of public and private agencies to resource development, must undergo fundamental changes. Communities and households need to incorporate concepts of conservation and sustainability into their production and extraction system. Agencies must understand that technicians, administrators, and bureaucrats do not implement natural resource management practices -- farmers and fishers do, motivated by economic incentives. Important socioeconomic and cultural constraints are:

- lack of viable alternatives to degrading resource utilization practices;
- large displaced populations of refugees from the war,
- lack of experience in dealing with outside agencies;
- no incentives for wise use of renewable resources;
- no general knowledge among the population of the critical state of the natural resources of El Salvador; and
- poverty and health problems.

Technical Constraints

It is estimated that changing traditional cropping methods for improved practices with conservation measures could nearly triple maize and bean yields, and increase net returns several times. Agriculture is one of the most important contributors to the economy of El Salvador. It provides ___% of GNP Unless more effort is given to conserving and improving the management of natural resources, the contribution of the agricultural sector to the economy is in jeopardy. There are no major technological constraints since soil conservation methods are already well understood by technicians.

However, soil depth and slope limit the kinds of technical interventions that can be used. The following Table is a guide. The main limitations for implementing soil conservation practices are the constraints perceived by the farmer. Each technique proposed to the farmer should be evaluated for its technical applicability and for its effects on the farming system as a whole.

TABLE 1: LAND USE CAPABILITIES

SLOPE (%)	< 12	12-50	50-60	> 60
SOIL DEPTH (cm)				
> 50	Crops, agronomic measures	Crops with agronomic measures, mechanical structures	Fruit trees, mechanical structures	Forest
< 50	Crops, agronomic measures, mechanical structures	Pasture	Forest	Forest

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IV. IMPLEMENTATION STRATEGY

It has been demonstrated that soil and water conservation can reduce soil erosion if it is properly done. It also has been established that the transference of such technology, either in developed or developing countries, is difficult even when direct benefits are shown to the users.

In order to create conditions favorable for adoption and diffusion of soil conservation techniques, all treatments must be economically and socially acceptable to the farmers, ecologically sound, and constructed with material locally available.

The number of soil conservation technical choices offered to farmers should be kept to a minimum. It is better to transfer one technique to a hundred farmers than a hundred techniques to one farmer.

Soil conservation activity in the AA should follow a technology transfer (TT) process that allows participating farmers to see results during the first cropping season. There are three phases in the transfer process.

Phase 1. Team building, technology selection, and training in the proposed practices. This phase consists of selecting PROMESA team members. Technicians and NGO personnel will do a baseline study of the area to define farming systems and constraints to production. From that information the best technology to fit farmers' traditional system will be selected. This will be followed by training in the selected techniques as well as training in TT materials and methods. The process of refining our understanding of farming systems will continue, but the initial phase should not take more than three months.

Phase 2. Direct extension. The first step is to explain to the community what the project is, in order to avoid creating expectations that cannot be achieved. This is a very important step because the community might have high expectations of PROMESA that are outside the scope of the project.

In collaboration with implementing NGOs, farmers willing to participate in the project will be selected. Initially, PROMESA will attempt to select farmers that are respected by their peers, and who are of the same socioeconomic class.

The first field activities will be demonstration plots with a number of farmers who are candidates for NGO action agents. Local NGO action agents will be selected by their membership. They will be closely supervised to eliminate the possibility of improper installation of the techniques. Demonstration plot practices should be clear, simple, visible, and well managed.

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A demonstration plot is a comparison between the proposed technological package and the traditional methods practiced by the farmer. The objective is to provide neighboring farmers with an opportunity to compare the labor, material requirements, and yield of the new practice with the traditional one. During the cropping season the plots are used as demonstration tools for visiting groups of farmers. As much as possible, all explanations should be given by farmers, with the NGO action agent acting as a facilitator

Field testing of new technologies will occur throughout the LOP and will be done through on-farm experimentation with technical supervision from the PROMESA team. The project will provide risk-sharing support to participating farmers in the form of a guaranteed minimum return at harvest from the plot. Any deficits will be covered by the Project. Testing will be done in association with "productores enlace" (contact farmers) to facilitate later technology transfer to the community. Once technologies have been proven successful under local conditions, they will become part of the action packages promoted by the implementing agency. There is a difference between a demonstration plot and an on-farm trial. This difference should be clearly explained to the participating farmer to avoid confusion.

Phase 3. Indirect Extension. The objective of this phase is to use the experience gained during the second phase. The farmers who installed demonstration plots now become NGO action agents, training other farmers.

At this point the appropriateness of the technological package will be shown. Those practices that diffuse without incentives are appropriate; those that don't aren't. Experience in different developing countries has demonstrated that agronomic soil conservation practices spread among farmers without an extension agent present. Mechanical soil conservation, however, is labor intensive. Farmers are not eager to adopt these methods without an incentive.

Phase three is important for PROMESA because the goal is to leave practices in place that continue to diffuse and expand when the project is over. This will happen only if farmers are able to clearly identify productive and/or income benefits of the technical package.

V. ACTIVITIES

From a technical point of view, SWC practices must protect the soil from raindrop impact and reduce the slope length and degree. This will reduce the rate of overland flow, thereby increasing the opportunity for water to infiltrate into the soil, and reducing the erosive capacity of overland flow. Benefits to the farmer derive from increased organic matter in the soil, more

soil water available longer for crops, retention of soil during the rainy season, and production of a secondary source of income (from some practices).

Two categories of activities will be applied in the field -- agronomic practices to improve farm productivity, and mechanical structures to reduce the erosive force of water. These two should be combined to accomplish the Project objective of enhanced NRM with socioeconomic benefits to farmers. All activities should be established by farmers using locally available materials and "A-frame" levels.

A. AGRONOMIC PRACTICES

The group of practices most likely to be applied are the agronomic practices, because they embody the following advantages.

- Low risk.
- Low cost.
- Improvement of organic matter in soil.
- Retention of soil humidity.
- Most materials required can be obtained locally.
- Often generate secondary products to increase income.
- Easy to understand and learn.
- Diffuse among farmers without extension effort.
- Do not disrupt farmers' traditions.

Disadvantages are:

- Reduced efficiency as the slope increases.
- Might increase pests if improperly managed.

Minimum Tillage and Mulch

Minimum tillage consists of applying the least amount of plowing to the soil necessary to create the appropriate conditions for seed germination. This is a traditional practice utilized by farmers, but what causes erosion damage is the burning of crop and weed residues on top of the soil. In some soils the burning is done to reduce acidity, but in El Salvador soil acidity is not a problem If residues were instead left to cover the soil, raindrop impact would decrease during the first month of the rainy season.

There are three types of minimum tillage: continuous, localized, and zero tillage, illustrated in Figures 1 and 2. This type of practice is ideal for basic grains (maize, beans) in a low input cropping system. Due to the low disturbance of soil it can be used on up to 50% slopes, if the residues are not removed.

Minimum tillage maintains soil stability, increases water infiltration, protects soil from raindrop splash, increases

organic matter in the medium term, requires little labor, controls weeds, and is very similar to traditional practices The disadvantages are that it does not produce significant yield increases during the first years, and crop pests may increase because of the presence of crop residues.

Traditional slash and burn agricultural techniques lead to a rapid release of stored nutrients, many of which are quickly lost to crops through erosion and leaching. The destruction of the soil's organic matter at the time of burning alters soil structure, often lowering its ability to store water, leading to greater run-off and sheet erosion. In contrast, slash, mulch and green manure systems encourage the incorporation of residues into the soil, eventually improving organic matter content, water retention, cation-exchange capacity, and soil structure. The movement away from burning agriculture crop residues and toward fallow cover vegetation will provide organic matter and nutrients needed to maintain productivity and provide greater stability to cropping systems. This shift from traditional methods will increase long term production at little additional cost to farmers or to the Project. PROMESA will encourage on-farm research related to various legume and forage species that have potential as green manures and mulches.

Trash Lines

After harvest, stovers (crop residue) are usually burned in preparation for the next crop, or spread over the soil surface as discussed above. Crop residue can be employed in two other ways. The first is to stake rows (about 50 cm wide) of crop or weed residues on the contour in the cropped area. This creates a physical barrier to overland flow, reducing velocity and retaining soil. The second is "improved" trash lines. Contour lines are traced with an A-frame level, a narrow trench is opened along the contour line, and the stover is buried in the trench. This has an advantage over merely leaving the material on the surface because habitat for rodents and insects is reduced and the material decomposes into the soil more rapidly. Some soil conservation is gained during the first year after installation, but it is not permanent. Improved trash lines could be used to provide a favorable site for planting hedgerows of fast-growing trees the following year. This is especially true if soil moisture is limiting, since the buried trash would provide a moister microsite. The disadvantages are that the soil conservation effect is short-lived, and crop residues cannot be used to feed animals.

Contour Cultivation

One of many problems in hillside farming is the traditional way of plowing up and down the slope. Contour furrowing as a land preparation technique will be encouraged by PROMESA. Using "A-frame" levels, farmers are able to stake out the contours and then prepare furrows (manually or with oxen and plow) for

planting. Contour cultivation increases water infiltration, reduces laminar erosion, and facilitates cultivation and uniform planting density and distribution. More time than usual will be required the first time contours are traced in the field. Improperly designed contours may create erosion problems by concentrating water flow

B MECHANICAL SOIL CONSERVATION STRUCTURES

Mechanical soil conservation structures will be extended by PROMESA where appropriate. This set of soil conservation practices are to be implemented in areas where the slope is too severe for effective vegetative measures, and for ravine control. Advantages of such structures are that they:

- quickly modify the terrain slope,
- increase water captured for crops, and
- may generate secondary products to increase income.

Disadvantages include:

- High cost.
- High risk.
- Reduction of soil fertility the first years.
- Material required is sometimes from off the farm.
- They are hard to understand and maintain.
- They do not diffuse among farmers without extension effort, and usually require incentives.
- They disrupt farmers' traditions.
- They are labor-intensive during the building stage
- Maintenance is required to sustain good performance.

Examples of mechanical structures are hillside water diversion ditches, infiltration ditches, mini-terraces, stone walls, and bench terraces. Selection of mechanical structures will depend on local land/soil and climatic characteristics.

Micro Terraces

These are individual "fishscale" terraces planted with bananas or high-value fruit trees (Figure 3). Small circular bench terraces are dug into the slope with a surface area appropriate to the size of tree planted - usually 2 to 4 m^2. The topsoil is removed, the subsoil is cut away from the upper slope and filled into a semi-circle of stones defining the lower part of the terrace, and then the topsoil is returned. If stones are not available, the soil filled into the lower part of the terrace is stabilized by planting with grass. A slight negative slope conducts rainfall into the slope. Holes are dug for the trees and the trees are planted. Soil between the terraces should be planted to a grass.

Bench Terraces

Terraces are built by cutting and filling soil on the contour, or on a 0 5-1.0% slope in heavy rainfall areas so as to remove excess water. Spacing and terrace width depends on slope and soil characteristics. Bench terraces diminish the slope, allowing control of water and erosion. They will not be encouraged because of the great labor costs associated with them and because they involve severe soil disturbance during installation.

Infiltration Ditches

Infiltration ditches are excavated on the contour with approximate dimensions of 75 cm wide by 60 cm deep, and at a spacing of 5 to 12 m depending on local slope and rainfall (All dimensions are subject to change depending on specific characteristics of the area.) Ditches capture runoff, reducing its velocity and allowing improved infiltration. A green barrier of selected grasses is planted along the ditch, serving as a source of animal feed. Some ditches are built with a very slight slope in order to convey water out of the field. These would be appropriate for areas having very intensive rains (Figure 4).

Rock Walls

In areas with abundant rock, farmers are encouraged to construct simple walls on a contour line. Rocks are collected from the surface of fields and stacked or piled at spacings dependent upon slope and rock abundance. The walls reduce runoff velocity, help increase infiltration, and clear cultivation areas of obstructions (rocks). As time passes, a terrace will form (Figure 5).

Gully Control Structures

These structures are not intended to influence productivity directly, but to stabilize ravines or a portion of a river. The two most common kinds of structures are check dams and gabions.

Check dams are designed to mechanically lessen the speed of flowing water within in creek or ravine, thus diminishing its erosive potential. They can be constructed from local materials such as rocks, poles, or bales of straw. Each dam is specifically engineered to the physical and hydrologic characteristics of the specific channel, and so can take various forms. Where swift flows are anticipated dams must be "keyed" into the channel to anchor them. Dams are sometimes covered with filter fabrics on the upstream side so as to avoid piping and accelerated sedimentation. Within the project area, most check dams will be only a few feet in length, necessitating little site disturbance (Figure 6).

Gabions are also mechanical structures intended to decrease water velocity by increasing frictional surface and to ameliorate erosion by armoring channel side slopes. In simple terms, they are wire baskets filled with sorted rocks placed along highly erodible areas. They can be constructed rapidly with minimal training. Gabions stabilize the channel and prevent sediment from reaching the river bed. They are expensive to install, but provide a good wage labor opportunity for local populations.

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MANGROVE ESTUARY RESOURCE MANAGEMENT

INTRODUCTION

Approach

For any given NRM project, sustainability can be pursued in one of several ways: via legislation and strong enforcement; by convincing the resource users that it is in their best interest to protect and manage the environment in which the resource of interest is found; or through negotiated agreement between the macroecological goals of the project and the microeconomic goals of the farmers and fishers. Presently, the first method is not an option in El Salvador because of inadequate environmental policies and enforcement capability for even the most basic environmental protection laws. The second alternative seems unfeasible for the PROMESA action areas, where resource depletion and microeconomic needs are great. Only the last, "negotiator mode" seems a viable approach to AA activities (see Social Soundness Analysis.) In keeping with the Project strategy as a whole, it makes room for informed decision-making on the part of resource managers themselves, taking into account their attitudes and perceptions of the relationship between environment and their social and economic well-being.

Indeed, the approach to designing action area activities has been throughout to *recognize the local people in each area as the true resource managers*. They are the ones who ultimately must decide in favor of change and who will be the real Project implementors. Therefore, via their local organizations, they must be an integral part of PROMESA activities from the start, if these are to have any chance of success.

Of course, this makes definitive *ex ante* project design difficult, because a very important variable over which designers have little control -- human behavior -- is thrown into the equation. The matter is further complicated in El Salvador's mangrove estuaries by the current, open-access regimes of land and water tenure. Convincing subsistence farmers that soil and water conservation is in their best interest because it will improve production on the farmers' own land is difficult enough. More difficult still is the fact that both the lands and the waters of El Salvador's mangrove estuaries are public property. This generates an "If I don't take it someone else will" mentality that is much harder to deal with when designing "people" projects for such areas.

- unmitigated destruction of mangrove forests;
- overharvesting of coastal resources; and
- contamination of estuarine and marine waters by agrochemicals and human wastes.

These problems are well documented and need not be re-analyzed here. (Detailed discussions can be found in Daugherty 1975, Castillo Duran 1977, Lopez Cepeda 1990, Gibson and Hardin n.d., Yanez Paredes et al 1991, and Foer 1991.) In preparation for PROMESA, Gibson and Hardin (op. cit.) performed a thorough analysis of environmental problems facing the nation's coastal zone and then presented, in broad terms, some options for possible interventions in the action areas. Some of the activities proposed below incorporate one or more of their general suggestions. Although all their suggestions for the mangrove estuary area have intrinsic merit, some were not considered appropriate for PROMESA.

- Fish aggregation devices (FADS). As their name implies, these devices make fish capture easier by providing physical structure in a featureless landscape. Although their presence may facilitate exploitation of some species that are not presently being used commercially, they can be devastating to declining populations by making it easier to capture the remaining individuals. Whether FADs actually help augment local populations is presently a hotly debated issue.

- Long line fishing. This is another technique that is effective and may allow exploitation of under-utilized species thus easing the pressure on overharvested ones. As with FADS, however, it is non-selective. Thus, by-catch of some species may present problems. It does not enhance local environmental awareness and understanding of the habitat-catch connection; and its intrinsic environmental benefits do not warrant high priority. This type of activity would fit much better under a fishery enhancement project than under an environmental improvement project such as PROMESA.

- Charcoal production. This activity has good potential for increasing income but does not directly address PROMESA's goals of environmental improvement and increased environmental awareness. It may be more appropriate for upland lots where woods other than mangrove are used. Again, even though the activity itself is certainly worthwhile, it does not address PROMESA's primary goals.

- Improved fish handling and storage infrastructure. The same remarks for charcoal production apply here. In addition, according to interviews with fishers and fishmongers themselves in the start-up AA, this is not a pressing

problem for them. Demand is such that reportedly people can sell as much produce nearly as fast as they acquire it If demand is temporarily slow, they turn to solar drying.

- Extensive shrimp mariculture in degraded mangrove areas. This activity has the potential for causing more adverse environmental impacts than benefits (see also section on resource over-exploitation, below). PROMESA's goals of environmental protection and restoration are better served by restoring degraded areas than by using them for potentially harmful activities that, if successful, would encourage further degradation of mangrove forests.

- Rotational clearcuts for fuelwood in designated mangrove areas. Some form of rotational clearcutting is certainly a worthwhile and ecologically defensible activity that eventually will need to be examined. However, the severe degradation of the mangrove forest, together with the lack of national and local expertise in this exploitation technique makes this activity unsuitable at the beginning of the Project.

Instead, the following activities are proposed for the PROMESA action areas.

- Inventory of mangrove forests
- Mangrove forest restoration.
- Creation of productive buffer zones on the landward edges of mangrove forest.
- Privatized facilities for grow-out and protected breeding of selected, economically valuable shellfish species.
- Pilot microenterprise alternatives to fisheries and mangrove cutting.
- Minimal research and monitoring activities that are essential to Project functioning and/or to further progress in natural resource protection and management in the mangrove estuaries.

The following attributes of potential AA activities were considered important during the selection process: direct environmental benefit, local population involvement, demonstration of the relationship between resource exploitation and a healthy environment, illustration of the concept of sustainability, economic benefit, and sustainability at EOP.

MANGROVE FOREST INVENTORY

Destruction and degradation of the nation's mangrove forests is the single greatest affront to the coastal zone environment. Major impacts include:

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- cutting mangroves for firewood and other uses;
- excessive sedimentation due to lack of soil conservation practices in the uplands;
- draining mangrove forests for agricultural development;
- contamination with agrochemicals and human wastes;
- destruction of mangroves for construction of salt or shrimp ponds.

Mangrove forests are essential to the functioning of the estuarine system. They provide irreplaceable habitat for hundreds of species of invertebrates, birds, fish, and mammals, they are highly productive and form an important link in marine and estuarine food chains; they serve as nursery and breeding habitat for many species of sport and commercial fishery value such as shrimp, crabs mollusks, and fish; they function in erosion protection, water conservation, and sediment trapping; they are natural filters for contaminants and excess nutrients flowing into the estuary; they moderate microclimate and physical conditions of the substrate; they are critical in the energetic dynamics of the estuarine system; they have intrinsic aesthetic value and recreational potential; and more. Perhaps more importantly, mangrove forests provide the structure under which most estuarine functions and interactions operate. Without them the nation's estuaries as we know them will cease to exist.

Thus, *protection and restoration of the nation's mangrove forests should be one of PROMESA'S highest priorities*. A critical step in planning for this task nationwide is an inventory of the remaining mangrove forests. Currently, there are no reliable data on the extent and location of mangrove forests in El Salvador. Every new report contains different (sometimes widely so) data, and no verifying summaries are available. This makes land use planning and development design difficult. Thus, using remote-sensing technology, PROMESA will undertake a mangrove forest inventory, starting with the AAs and then including the whole coast. Ground-truthing will enhance the information obtained through remote sensing. Additional ground inventories will be contracted with ENGOs to allow estimation of basal areas, volumes, and densities required for future mangrove management in AA subsites where forest exploitation by Project participants is foreseen (see later sections).

MANGROVE FOREST RESTORATION

The mangrove restoration activities proposed below for the action areas are essential if the Project is to have any relevance to the environmental problems of El Salvador's coastal zone. Given the urgency of the situation, token restoration via many small demonstration activities is counterproductive and inconsistent with PROMESA's goal of protecting the environment. One substantial activity that really makes a difference is orders

of magnitude more desirable than many small activities spread out throughout the country. Thus PROMESA proposes to promote large scale mangrove planting throughout the coastal subzone of the AAs.

Mangrove Planting

Since the 19th century, mangroves have been planted by humans for different purposes (Walsh 1974). In southeast Asia, large mangrove stands were established and have been maintained to this day mostly from replanted or nursery stock. In the Americas, mangroves have been planted primarily for restoration, as mitigation for various environmental impacts, for research, and for erosion control. Some of the methods for planting mangroves are:

- direct planting of propagules collected from trees,
- planting of seedlings and trees grown in nurseries;
- transplanting of seedlings and trees removed from the field;
- broadcast of propagules from the ground;
- aerial planting by dropping propagule "missiles" (propagules enclosed in bags with stabilizing streamers) from an airplane; and
- air layering.

Direct planting of propagules is the cheapest and simplest method of replanting and is the method of choice for PROMESA, at least for mangroves such as *Rhizophora mangle* and *R. racemosa*. This method is straightforward, and does not require special skills or equipment. Its disadvantages are that plantings must coincide with propagule production, and that time must be spent collecting and transporting the propagules. Furthermore, in species like *Avicennia germinans* and *A. bicolor* their propagules will not germinate unless the testa (seed coat) is first shed (Steinke 1975).

Planting seedlings and trees grown in nurseries is also a straightforward method but it requires establishment of a nursery with all the associated costs. Although plantings of larger trees of several species have in general met with good success, the costs and labor involved argue for the use of this method only under special circumstances. However, seedlings may be a necessary alternative for more-difficult-to-root mangrove species such as *Avicennia germinans* and *A. bicolor* (see later section on nursery).

Transplanting seedlings and/or trees from the field has also met with good success, but the labor, costs, and the complexity of the process make it unsuitable for the action areas. Furthermore, this method is destructive because viable individuals are removed from natural areas.

Broadcasting propagules without actually inserting them in the ground has not been successful because the majority are washed away by tides. In general, the propagules that become established do quite well if they germinate in the correct zone, but the number remaining is generally low. For that reason, this technique is not recommended for the action areas.

Propagule "missiles" have been used successfully in Vietnam and Florida (Teas and Jurgens 1979). They have potential for use in large areas that are not easily accessible, but this method should be considered only under those circumstances. Air-layering of mangroves (starting seedlings on branches with moss for planting later) is still experimental and, therefore, not recommended for use in the AAs.

Site Selection

Three of the most critical factors in successful mangrove planting are: the energy characteristics of the site, the substrate stability, and the elevation within the intertidal zone. Plantings in high-energy shorelines have in general been unsuccessful because of mechanical damage to the propagules or because propagules were dislodged by waves and currents (Hannan 1976). Similar results were obtained when planting in shifting or eroding shorelines, even when using some type of erosion protection (Lewis 1982).

The elevation of a site in relation to sea level in great part determines the species of mangrove that will do best at the site. Thus, it is imperative that this factor be considered in the AAs. In general, the Rhizophoraceae can be planted in zones of greater inundation than species found in the upper intertidal. Rabinowitz (1975) found that *L. racemosa* transplants did not do well at the lower elevation zones normally occupied by *Rhizophora*, but *A. germinans* did well at all elevations. Goforth and Thomas (1980), found that survival of both propagules and seedlings of *R. mangle* was twice as great at the +0 1 m tidal level as at 0.0, whereas Teas et al. (1976), found that natural establishment of *A. germinans* and *L. racemosa* was best at or above +0.4 m mean sea level (msl). In general, each tree, regardless of species, should be planted at an elevation similar to that at which it originally grew (Pulver 1976).

Success Rates

Most recent mangrove plantings have produced between 45% to 100% success rates (Lewis 1982). There have been some failures, mostly in experimental plantings or in cases where the variables indicated above were ignored. (e.g. plantings too low or too high in the intertidal zone, planting in high energy shorelines, etc.). In El Salvador, (mostly Rhizophora) mangrove plantations

have generally been successful. For example, the CEDRO plantation in Jiquilisco reportedly resulted in an 85% survival of planted propagules. Some plantations, however, have failed mainly because the propagules were planted too low relative to mean sea level (pers. obs.).

Losses of some of the propagules are to be anticipated. Some of the major causes of propagule losses are: physical removal by tides or floating debris; predation on seedlings (crabs, raccoons, snails, etc.); death of seedling by natural causes, and; planting at incorrect elevation in relation to mean sea level.

Procedures

During PROMESA's first planting year (Project year 2), only *R. racemosa* mangroves will be planted. The propagules used will have to be collected directly from the trees to ensure that they are not from *R. mangle*. Sites will be selected well in advance of the planting date and will reflect the naturally occurring elevation range of *R. racemosa* in the area. Site suitability may be determined in a number of ways.

- By determining that the desired *Rhizophora* species occurred at the site in the near past (plant remains, etc.). Usually *R racemosa* dominates at consolidated ground in the front areas of the forest, while *R. mangle* is confined to the muddy point-bar sections of meandering channels.

- By direct comparison with nearby mangrove areas that have the desired Rhizophora species.

Within each AA, priority will be given to the largest contiguous area that is suitable for the given species. The site will be cleared of debris that could damage propagules when moved by tidal forces. Dead trees will be removed and used for firewood. Large branches and logs on the water edge of the site may be left in place to act as a wave barrier so long as they do not interfere with the flooding regime. After the area is cleaned up, reference lines will be established using stakes and string to assure proper spacing

Plants will spaced at 1 m intervals to yield a total of 10,000/ha. Source material will be naturally occurring mature propagules collected from the trees. Plantings will be scheduled for July-November to coincide with peak propagule production in El Salvador. Propagules will be collected and transported to a staging area where those that are unsuitable (too young/old, damaged, or showing signs of disease) will be discarded. The propagules will be planted no more than 24 hours after

collection, at depths of 10-20 cm depending upon the substrate. If propagules are still available, replanting of propagules that fail to germinate will be done 2 months after the initial planting.

Avicennia species will be planted starting the second planting year (Project year 3) in suitable areas. *Avicennia* propagules require an anchoring period in order to root; otherwise they are washed away by tides. A large percentage of the propagules produced in the forest are usually lost in this way. On a small scale, other studies (Jimenez and Sauter 1991) have tested an innovative planting technique for *Avicennia* propagules in high-inundation areas. First, propagules were collected directly from reproductive trees. They were then immersed in brackish water and, after a few hours, the seed coat released. Next, they were anchored to the ground with paper clips; after 10 days the clips were removed. To avoid replanting any failed propagules and to increase survival chances, three might be anchored in the same point. This innovative, low-cost and "low-tech" planting technique will be tested on a larger scale in the start-up AA. If successful, it will be used in preference to an expensive and non-sustainable nursery operation for *Avicennia* species (see below). These seedlings should be planted during Project year 3 in July-October, the rainiest part of the year.

For all mangrove planting, records will be kept on growth rates, percent losses, causes of death, and general meteorological conditions throughout the LOP. An initial goal of replanting 100 ha per year will be adjusted on a yearly basis.

Local Costs

The cost/ha of mangrove planting depends upon a variety of factors including plant spacing, material used, costs of labor, site accessibility, and others (Table 1) It is important to recognize that reducing spacing by a third more than doubles the number of installations required. Most recent plantings of propagules have used spacings of 0.91-1.00 m. Closer spacing is considered wasteful because as the trees grow, shading and mechanical interference between adjoining trees may prevent optimal growth.

Table 1. Estimated cost ($/ha) for planting R. mangle at various spacings (after Teas 1977 (T) and Aguilar Reyes 1991 (A)).

PROPAGULE SOURCE	REF.	SPACING (m)		
		0.30	0.61	0.91
COLLECTED				
	T	10,175	2,470	1,140
	A			90*
PURCHASED				
	T	11,251	2,742	1 261

* Assumes an exchange rate of 8.00 colones per dollar.

Very little published information is available on personnel needed for the various stages of mangrove plantings. Some estimates are displayed in Tables 2A and 2B following Lewis (1982) and, in El Salvador, Aguilar Reyes (1991). As the tables indicate, there is considerable variation both within- and between- activities, source materials, and techniques. Furthermore, there are marked differences in the estimates for the same activity in the two tables.

Table 2A. Personnel estimates for mangrove plant material collection and installation (after Lewis 1981). C = collection, I = installation, T = transplantation.

SPECIES	MATERIAL	TASK	SPACING (m)	PERSON-HOURS
R. mangle	Propagules	CI	0.8-1.0	1828/ha
R. mangle	Propagules	C	-	400-1000/hr
R. mangle	0.4-0.8 m tall trees	T	1.0	3098/ha
R. mangle A. germinans	Propagules	CI	0.8-1.0	457/ha
A. germinans	0.3-1.9 m	T	1.0 m	2541/ha

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Table 2B. Estimated personpower requirements for mangrove plantings with 1 x 1 m spacings in El Salvador (after Aguilar Reyes 1991)

TASK	EFFICIENCY (propagules/personday)	PERSONDAYS/HA
Collection	1,500	6.67
Transport to central site	20,000	0.50
Propagule Selection	10,000	1.00
Transport to planting site	20.000	1.00
In-site deployment	10.000	1.00
Planting	1,000	16.67
TOTAL	-	21.84

(At 32.80 colones per man day = 716.35 colones/ha)

The estimate of 1,828 personhours/ha in line one of Table 1A is extremely high compared with the others. A reasonable estimate of the planting costs for PROMESA may be derived by using the mean of 457 hours/ha (Table 1A, line 4) and 21 84 persondays/ha = 174.7 personhours/ha (Table 1B) and the salary rate of 32.80 colones per day given by Aguilar Reyes. Thus we have:

<1> [(175 + 457 hrs / 2) / 8 hrs/day] = 79 persondays/ha.
<2> 79 persondays/ha x c32 80 /personday = c2591.2/ha
<3> c2,591.2 at c8 per $ = $323.9/ha

Local personnel summary: (personmonths/yr - 100 ha)

Collecting propagules and planting:	300
Replanting:	100
Supervisory:	120
Maintenance:	36
Technical:	6

Mangrove Nursery Option

If direct anchoring of *Avicennia* propagules proves unsatisfactory, then seedlings will have to be produced under conventional nursery techniques and re-planted in the field after

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a short growing period (Lewis 1982). A nursery would then be established in one AA. It would not only provide stock for AA mangrove restoration, but might eventually serve as a source (on a sale basis) for other restoration projects undertaken in El Salvador. The nursery would devolve to the management of the LO and/or national NGO who assist in its construction and operation, or to a government agency. Although the number of mangrove restoration projects will likely increase in El Salvador, the post-PROMESA market for mangrove seedlings is presently unknown.

Details of nursery establishment and operation will depend on the site, the species, and the size of the nursery. The implementing team will develop detailed plans after they are on-site. Techniques for establishment and maintenance are straightforward and well documented (Stern and Voigt 1959; Connor 1969; McMillan 1971, 1974; Banus and Kolemainen 1974; Sidhu 1975, Steinke 1975). Mangrove nursery experts will be consulted as needed The following guidelines will be used in the design and operation of the nursery.

- No mangroves will be destroyed or displaced. It is preferable to site the facility in high areas near a source of estuarine water and pump the water up to it. Need for large quantities of water is not anticipated.
- Emphasis will be placed on *Avicennia germinans* and *A. bicolor*, but *Rhizophora mangle* will also be grown to allow maintenance planting when no propagules are available.
- The facility will be large enough to accommodate AA needs plus produce a surplus for sale to other parties.
- Existence of the nursery will be made known to all parties and agencies likely to be involved in environmental restoration.

BUFFER ZONES

Establishment of buffer zones on the landward edge of mangrove forests will offer a great deal of protection to the mangroves. Furthermore, management of this buffer zone for wood extraction would relieve some of the extractive pressure from the mangroves. A major problem, however, is that in most places agricultural lands extend to the edge of the mangrove forests, leaving little or no room for the buffer. Possibilities for creative land tenure and policy initiatives are discussed in the social soundness analysis and in the PP description of the AA component. For technical details of buffer zone establishment, consult the forestry and agroforestry annex.

PROTECTED BREEDING AND GROW-OUT OF SHELLFISH

Most commercially important crustaceans, finfish, and shellfish in El Salvador are overexploited or mismanaged (Juarez

and Orellana, 1985). For example, sustainable effort by the shrimping industry has been estimated at less than 53 ships (Abrego and Sosa 1990). Yet at present there are over 90 active ship licenses. As a consequence, shrimp catches and the average size of individuals captured have declined precipitously during the last 10 years (Abrego & Sosa 1990), and a 50% decline in shrimp reproductive size classes has been observed since 1965 (Juarez and Orellana 1985). The finfish industry is in a similar situation (ibid.). For example, during a recent team trip to a fishing town on the west coast of San Salvador, the local kiosks were serving chicken as there was no fish to be had!

Likewise for shellfish. Artisanal fishing of the two mangrove clam species -- *concha negra* (*Anadara tuberculosa*) and *curil* (*A. similis*) -- was formerly one of the most important fisheries in El Salvador. Now it is near collapse in some areas, with only very young individuals being harvested. A larger related species, *Anadara grandis*, is on the verge of extinction (Cheney et al. 1988). There is no hope for recovery of *Anadara* populations unless the young individuals are protected and allowed to reproduce.

Contamination of estuarine waters with agrochemicals plus loss of habitat due to mangrove destruction are co-culprits in these declines. But there is no question that overharvesting and mismanaging have been major contributors to the present situation. Several population-level actions can be taken to improve the state of El Salvador's fisheries.

- Limit the number of people harvesting a given species according to the state of the species' population.
- Establish closed periods to protect individuals during the important mating and reproductive periods.
- Establish size or age limits to protect individuals with the highest reproductive potential or at particularly vulnerable stages in their life cycles
- Artificially maintain populations through breed and release programs.
- Remove pressure from the natural populations by producing market-grade artificially bred stocks.

The first three items have socioeconomic and policy/enforcement components that will be explored jointly by PROMESA's AA and policy components. The last two options involve various types of aquaculture. Population maintenance through breed and release programs is typically a technology-intensive endeavor that is often experimental in nature and that survives only through subsidies or as a research tool. Furthermore, it does not accommodate population problems due to habitat loss and degradation. These problems must be addressed first if the program is to be successful. Hence PROMESA's initial focus on

mangrove reforestation and upland soil conservation, the latter bolstered by EE efforts to educate upland farmers in proper pesticide use (see relevant technical annex).

There are two types of commercially-motivated aquaculture: large scale intensive enterprises, and small scale individual or group projects. PROMESA involvement in intensive aquaculture is not recommended for the following reasons.

- It is often destructive of natural habitats, particularly mangroves and other wetlands vegetation. For example, in southeast Asia, thousands of hectares of productive mangrove forests have been destroyed for aquaculture projects. It is widely believed that destruction of mangroves for the construction of shrimp ponds in Ecuador is responsible for the declines in postlarvae abundance (Olsen and Maugle 1988). Use of already degraded sites (e.g. abandoned salt ponds) for aquaculture should be contemplated only after restoration of the site to more natural conditions has been eliminated as a feasible alternative.
- Via collection of seed stock, the industry has a large impact on natural populations unless it is totally self-contained --e.g., by including its own hatcheries. Great quantities of seed stock are usually required, and collection is often inefficient, with mortalities of 50% or higher frequently being the norm. Furthermore, by-catch of other species is usually large, thus contributing to their decline.
- Hatchery technology is not straightforward and in many cases has not been proven to be practically and economically feasible (Olsen and Maugle 1988).
- Highly-skilled technical personnel are required.
- Intensive aquaculture often contributes to habitat degradation, e.g. via eutrophication and salinization of coastal lands.
- The economics of the industry are uncertain and fluctuating.
- High initial investment and intensive maintenance are required.
- The activity does not contribute to increased awareness of the relationship between habitat quality and quantity and the abundance of commercially important organisms.
- Finally, largescale commercial aquaculture is capital- rather than labor-intensive. Thus, in addition to negatively impacting the environment, it displaces artesanal fishers and other people that depend on fisheries for their economic survival.

However, small scale aquaculture bolstered by a simple, protected breeding plan <u>is</u> a feasible PROMESA initiative. Several such pilot activities are proposed for testing in the startup AA and, if successful, extension to subsequent AAs. These center on the unique shellfish species of El Salvador's

mangrove estuaries, for several reasons. First, PROMESA funding is such that AA activities must be highly focused The Project simply does not have the resources to address all of El Salvador's fisheries problems, even in a single AA. Second, these species have historically been of great commercial and cultural importance to the nation. Third, they are also the most important species to the poorer people of the estuaries -- those who are forced to overexploit the estuarine resources in order to survive. Fourth and finally, the national fisheries agency, CENDEPESCA, has paid relatively little attention to these molluscs, in comparison to e.g. shrimp and finsfish. PROMESA would thus have a "comparative advantage" in the area and one that responds to the most urgent needs of the mangrove estuarine peoples.

In order to restore breeding populations of at least some of the unique yet fast-disappearing mangrove clam species, PROMESA will introduce a "low tech" approach to their protected breeding and, ultimately, sustainable economic production. Because these clams are slow-growing, this activity will be coupled with a highly compatible oyster grow-out activity for participating fishers. Thus, fishers will perceive relatively short term (8 months) economic benefits from oyster sales while they plan for medium-term (18-24 months) returns to clam cultivation. These activities will contribute to the recovery of natural populations of mangrove clams by relieving harvesting pressure on wild populations. At the same time, they will serve as valuable tools in educating local resource users and the general public as to the intimate relation between habitat and sustainable economic gain.

Oyster Grow-out

Culture of marine molluscs has been practiced extensively throughout the world. In 1983, this activity generated over 80% of the world commercial aquaculture production (Cheney et al. 1988). Oysters (*Ostrea columbensis* -- *iridescens* (?) and *Crassostrea gigas*) were chosen as principal culture organisms for the following reasons.

- The technological base for culture exists and is being widely applied in other parts of the world.
- The biology of the organism is well known.
- There is a large and increasing market that has overwhelmed the local stocks. Principal markets are the residential and tourist centers of El Salvador, Honduras, and Nicaragua.
- It generates local employment, but requires little technical personnel.
- It requires relatively small expenses for maintenance.
- No supplemental feeding is necessary.
- There is strong local interest in the activity and a small

(8-10 tray) pilot project has already been started by CENDEPESCA.

- Its culture will exemplify the dependence of a valuable commodity on mangroves and estuaries and will thus serve as a valuable heuristic and educational tool
- Relevant techniques do not impact mangrove forests or other parts of the estuarine system.

Two different procedures are applicable to the action areas. The choice of techniques in AAs will be made after initial assessments at Project start-up

Tray Method. This activity will be initiated in the start-up AA with 100 trays, and will then expand to Jaltepeque and Jiquilisco with 500 trays each. The smaller number projected for the first AA reflects the fact that this estuary is smaller and shallower than the other two. The culture areas will be selected well ahead of the start date. The site must be at least 1.5 m deep at low tide, and must be relatively wide so as to allow navigation around the cultures. Salinities must not be below 20 ppt, and must not exceed 36-40 ppt for extended periods. It is extremely important that the site be well marked to prevent boating accidents, which could cause property damage and destruction of the culture trays.

Juvenile oysters will be purchased from local oyster fishers at approximately C 2.00/doz. They will be transported in jute bags to a nearby staging area, where they will be weighed, measured, and placed in the culture trays. The trays are molded plastic boxes measuring approximately 61 x 46 x 7.6 cm with numerous side openings to allow water circulation. Each tray is divided internally into equal-sized partitions. One juvenile oyster is placed in each partition, and the trays are then stacked in sets of 5-10 depending on the depth of the area, and then secured together. The sets will then be transported to the grow-out site by boat. An anchor will be attached to the bottom of each set, and a float to the top, and the set will be dropped overboard. The process will then be repeated until all sets have been installed. Individual sets will be attached to their neighbors with 0.64 cm polypropylene rope. The tray line will be oriented parallel to the prevailing currents to minimize resistance.

Each set must be kept free of fouling organisms that may block circulation (and thus cut the flow of plankton to the oysters). This will be done on a weekly basis by brushing each tray by hand with a stiff brush. Every fifteen days, the size and weight of a random sample of at least 10% of the culture population will be weighed and measured. Salinity, water temperature, and dissolved oxygen will be measured daily between the hours of 10 A.M. and 2 P.M. Oysters will be harvested after approximately 8 months, and new cultures started.

Oyster culture at this level is not intended to be a full commercial enterprise, but it is expected to evolve as a family business that supplements the family income. As the program progresses, control of portions of the facilities will be transferred to the local individuals that were hired to set up the facilities, and they will continue operations on their own. It is expected that a successful activity will raise interest in the community for additional grow-out facilities. At that point, PROMESA personnel will act as facilitators for setting up additional cultures.

Local personnel needed for this effort are estimated at 36, 24, and 12 personmonths, respectively, for non-technical maintenance, non-technical vigilance, and technical personnel.

Raft Method. This procedure involves collecting the oyster larvae that settle in collectors made of oyster shells and string, and then allowing the larvae to grow in strings of shells attached to a raft. The collectors consist of a set of wires through which valves are inserted via a hole drilled in the shells. The strings are tied together with nylon rope and the rope is attached to a float on the surface. The valves are left in place for a specified period of time and then retrieved for transfer to the grow-out facility. After the collectors are retrieved, the shells are removed from the strings and those containing newly-settled larvae (spat) are cleaned, and excess spat are removed to prevent competition (max 2 spat per valve). The shells so prepared are inserted into a 1.5 m long galvanized wire string and separated from each other by 5 cm long PVC sections. Each string is then suspended from a raft located at the grow-out site.

The raft can be of any size and construction. A good design for this purpose consists of a 5.4 m^2 raft constructed of wood with stringers every 0.6 meters. Floatation is provided by 4 to 6 (depending on the wood used) 54-gal plastic barrels attached to the raft frame. The shell strings are suspended from the raft stringers at 20 cm intervals. Maintenance of the valves during grow-out includes cleaning the valves of possible predators and competitors and maintenance of the supporting structures (raft, wire, etc.). Harvesting will probably occur 9-12 months after installation in the raft.

The advantages of this technique are that a larger number of oysters can be grown for a given effort compared to the previous one. Its major disadvantage is that it is critically dependent on adequate settling rates of spat on the collection valves. A set of three rafts will be installed initially, with additional ones put into operation if warranted by the results. Local personnel requirements are similar to the previous technique.

Culture of Mangrove Clams

Molluscs of the genus *Anadara* are in great demand in El Salvador. Populations of some species such as *concha negra* (*A. tuberculosa*) are being decimated by overharvesting and by removal of pre-reproductive individuals. Although it is illegal to collect clams smaller than 4 cm, the bulk of the catch in some areas is composed of ever smaller specimens. In El Salvador, the natural habitat of the *Anadara* group is the mangrove muck, under the shade of a healthy mangrove canopy. The young settle on the bottom and "burrow" a few centimeters into the sediments. Fisherwomen and children collect them by feeling the substrate and picking up any individuals that they find. While technology for intensive clam culture is well developed in southeast Asia (particularly Thailand and Malaysia), there is no information on methods of less-intensive "bottom culture" of clams in mangrove areas (Cheney et al 1988) Under PROMESA, the culture of clams and related species has three major objectives.

- To promote recovery of natural populations of *Anadara*.
- To obtain needed information on life history and population dynamics of the group.
- To provide a sustainable source of protein for estuarine dwellers.

While the initial objective is to promote recovery of AA clam populations, after a recovery period of 18 to 24 months, participating fishers will be able to collect mature individuals of *Anadara*. It is expected that after this period, with adequate tenurial structures (see below), sustainable extraction will be attained. Clam culture will be organized as a group effort in a circumscribed and protected area, working with women fishers -- the clam gatherers in El Salvador are almost exclusively women (and youth).

A series of 1 ha plots (modules) will be established in suitable mangrove areas and fenced off using posts and wire cloth. Each plot will be internally divided into 2 portions (5000 m^2 each) and each portion will be assigned to one woman. Each woman will then be paid market prices to collect juveniles (less than 4 cm) from other areas and place them in the substrate within her plot. (If necessary, juveniles will be brought from other mangrove areas in the country.) Each tenant will be encouraged to segregate the "implants" according to size to better keep track of their progress. Initially, the plots will be "planted" at densities of 5 clams per m^2. Each module will also contain a small facility for storage of tools and for vigilance of the module, a task that will be the responsibility of each group. The initial goal is to establish five modules, and expand if warranted by the results.

Grown clams (above 47 mm in length) will be harvested after 12-18 months, replacing the harvested individuals with juveniles. There will be no payment for replacement planting. Given that the sizes of the initial implants will not be uniform and that harvested individuals are replaced with juveniles, this will spread the size-class distribution in the plots so that after a few collections, harvestable individuals will always be present in each plot.

After several years, *Anadara* populations in the initial modules should be established with plenty of reproductive stock and the modules can be moved to a different location and operated with a combination of new participants and some from the original group that may wish to expand their operation. Note that this does not mean that harvesting of adults in the original modules will have to stop, because the local population should be stable as long as the young individuals are not collected. Instead, this scheme effectively creates sets of sustainable local mangrove clam populations with built-in groups of local stakeholders that will be interested in their maintenance and protection.

It is anticipated that a successful activity, coupled with an aggressive information campaign, will generate additional interest in the community for establishment of similar shellfish farms. Once PROMESA has run its course, there will be enough information and practical examples for local people to establish their own nurseries with assistance from the local and national NGOs. The details of the new installations are not as important as their establishment and maintenance. Except for the data collection, each module is designed to be run by its tenants, so phase-out of PROMESA personnel can begin soon after each module is up and running

Beyond the women participating in the Project, some monthly time of a technician will be needed to monitor growth rates and conditions. This technician should be a woman hired and trained from among the local population. Salinity, soil, and air temperature and dissolved oxygen will be monitored at each site on a monthly basis. In addition, a representative number of marked clams will be measured on a monthly basis to provide data on growth rates.

MICROENTERPRISE ALTERNATIVES

To relieve the extreme pressures on mangrove estuary resources, there may be little choice but to encourage many of the current exploiters of this ecozone to move into alternative economic activities. (See Social Soundness Analysis.) It is doubtful that there will be enough concessions to "go around." Thus, Project interventions may result in negative socioeconomic

impacts on certain population segments To mitigate such impacts, in consultation with local people, the Project may need to encourage microenterprise alternatives. Ideally, such options should provide not only an alternative to woodcutting and fishing as a source of income but also a protein substitution strategy such that local diets are not negatively impacted by foregoing fishing.

An example of one such alternative is raising iguanas and garrobos for food (and possibly skins and pets). There is considerable local interest in establishing iguana farms. People say they could probably sell or consume as much meat and eggs as they could raise. The technology for this activity is well-defined and the practices are not destructive of mangrove forests. And iguana and related species used to inhabit this ecozone. During implementation, local and regional experts and the existing literature will be consulted to design small pilot activities that may be expanded after further evaluation. A very successful private businessman has established an iguana farm near San Salvador. And a successful project on iguana culture has been conducted for several years at the Universidad Nacional of Costa Rica. Such experiences could provide a model for the initial stages of this effort.

Another microenterprise that will be organized is related to the extraction of firewood. Even though wood resources in the forest are severely depleted, demand for firewood will continue in the area because firewood is the main energy source for most families. Some areas of the mangrove forest can be managed on a sustainable basis. A study will be required to identify the areas suitable for firewood extraction. A LO could be organized to incorporate a significant number of families that collect firewood for their domestic needs. This LO could then be instructed in selective extraction techniques made on a rotational basis. This group will supply all its members with firewood. Families or individuals not associated with the group should be prevented from extracting firewood from the mangrove forest.

STUDIES AND DATA NEEDS

Mangrove Monitoring Plots

Future management of mangrove forest will depend upon sound information regarding stock and growth rates of the commercially important species. A permanent monitoring plot should therefore be established in several stands of *Rhizophora racemosa*, ideally in different development stages. Growth (dbh) increments and mortality will be recorded every 6 months throughout the LOP. Among other things, the information collected will also assist the Project to determine when or if rotational cutting for

firewood or other microenterprise might be indicated. It will also be used for interpreting and monitoring changes in forest recovery. Estimated cost of this monitoring effort is $40,000.

Tempo-spatial Distributions of Shellfish

Since one of the objectives of the grow-out efforts is to restore shellfish populations generally, PROMESA will need to monitor at least one AA estuary for their changing temporal and spatial distributions throughout LOP in order to determine Project impact. Data on size-class distribution, reproductive stage, stock analysis and species composition and distribution will be gathered in regular samplings to track the recovery of shellfish populations. Estimated cost is $40,000 for the LOP

INSTITUTIONAL ANALYSIS ANNEX D

PRINCIPALES ENTIDADES DEL GOES RELACIONADAS A LA ADMINISTRACION DE LOS RECURSOS NATURALES

INTRODUCCION

No se puede ignorar el rol que le compete desempeñar al Estado en cuanto a los aspectos normativos, politicos, administrativos y de manejo de los recursos naturales.

Sin embargo, en la mayoria de los casos las instituciones que tienen que ver con estos aspectos se encuentran desimplementadas, con escasez tanto de personal capacitado, como de asignaciones presupuestarias Como es de conocimiento, estos aspectos no les permiten cumplir a cabalidad sus funciones.

Las debilidades institucionales contribuyen a que los recursos naturales sean mal administrados. En la actualidad, la estructura institucional no esta suficientemente implementada y capacitada para regular y/o controlar el buen uso de los recursos naturales. Ante esta situacion se propone seleccionar a las instituciones que se encuentran mas íntimamente ligadas a la administracion de los recursos naturales, e identificar areas prioritarias de apoyo que sean de mutuo interes.

El reforzamiento institucional no debe ser un fin en si mismo, mas bien un medio a traves del cual podamos llegar a manejar de una forma racional los recursos.

El reforzamiento de algunas dependencias del Estado, asi como la conservacion de los recursos naturales, debe representar el interes mutuo, tanto por parte del GOES como de la AID. En ese sentido se propone establecer cartas de entendimiento o convenios en los cuales se determine en forma conjunta las actividades a implementarse, asi como las responsabilidades y compromisos de cada una de las partes.

En el presente documento se hace un análisis de las principales instituciones del GOES, las cuales dentro del marco de referencia de los componentes del proyecto PROMESA, se han identificado como las que estan mas directamente relacionadas con la administracion de los recursos naturales, identificando las dificultades que afrontan, sus necesidades basicas, así como oportunidades para reforzarlas, en funcion a los objetivos del Proyecto PROMESA.

I.- MINISTERIO DE AGRICULTURA Y GANADERIA (MAG)

Funciones y Responsabilidades

En armonia con el Plan de Desarrollo Economico y Social del Gobierno de El Salvador (1989-1994), el cual esta encaminado a lograr el crecimiento economico sostenido, y elevar el bienestar y calidad de vida de toda la poblacion, especialmente la que vive en extrema pobreza, corresponde al MAG como funcion esencial apoyar tecnicamente la produccion agricola, pecuaria, pesquera y forestal, asi como propiciar la conservacion y el uso racional de los recursos naturales del pais.

Para el cumplimiento de esta función, tomando en consideracion la limitacion de recursos, se ha adoptado como una politica general que los recursos tecnicos esten orientados para apoyar a los sectores mas necesitadoas, es decir a los pequeños y medianos productores agropecuarios.

Las acciones del MAG pueden resumirse en:

1.- Ofrecer servicios, innovaciones tecnologicas, asistencia tecnica a pequeños y medianos productores y adicionalmente la generacion de información sobre el sector, que envie las señales adecuadas al productor, a fin de estimular y promover su participacion en el proceso productivo agropecuario nacional. y

2.- Promover y vigilar la adecuada explotacion y conservacion de los recursos naturales.

Para cumplir con las funciones y responsabilidades, el MAG esta implementando una nueva estrategia sectorial, la cual contiene areas de politica que promueven el desarrollo y la eficiencia productiva del sector y la proteccion ambiental y el uso racional de los recursos naturales.

El MAG ha tomado un papel de liderazgo en la proteccion ambiental y en el manejo de los recursos naturales. Por tratarse de un area prioritaria, se realizan esfuersos conjuntos con el sector privado y las organizaciones no-gubernamentales, los cuales estan orientados al manejo y conservacion de recursos naturales, promocion de la reforestacion y mejora de de las practicas de conservacion de suelos y agua

Consciente de la necesidad de disponer de un programa que posibilite la recuperacion del medio ambiente, el MAG realiza acciones conjuntas con organizaciones ambientalistas. En este proceso de recuperacion se gestionara la reconversion de parte de la deuda publica externa por la ejecucion de un programa de proteccion de medio ambiente. Se ha creado la Secretaria Ejecutiva del Consejo Nacional del Medio Ambiente (SEMA), la cual coordinara y supervisara la implementacion de politicas y se encuentra

actualmente en la etapa de implementacion. Se revisaran y actualizaran las leyes de proteccion de los recursos naturales (ley forestal y codigo ambiental). Este esfuerzo sera complementado con la implementacion de una campaña de divulgacion sobre el uso correcto y la proteccion del medio ambiente.

Organizacion

La actual estructura organizativa del MAG es la siguiente:

1.- Nivel Politico Decisorio
Esta constituido por el Despacho Ministerial, que esta a cargo del Ministerio y Vice-Ministerio del Ramo, por el Consejo Nacional del Medio Ambiente (CONAMA), por el Conseko Consultivo Agrario Nacional (C.C.A N.), y por el Consejo Tecnico Asesor.

2.- Nivel de Asesoria.
Esta constituido pro las siguientes Unidades Asesoras:
-a) Oficina Sectorial de Planificacion Agropecuaria (OSPA),
-b) Oficina de Asesoria Juridica,
-c) Oficina de Auditoria Interna, y por la
-d) SecretarIa Ejecutiva del Medio Ambiente (SEMA).

3.- Nivel de Apoyo.
Esta constituido por las siguientes Unidades de Apoyo:
-a) Gerencia Administrativa, y por la
-b) Gerencia de Comunicaciones.

4.- Nivel de Unidades Operativas Centralizadas.
Esta constituido por las siguientes Unidades:
-a) Direccion General de Economia Agropecuaria (D.G.E.A.),
-b) Centro de Tecnologia Agricola, Pecuaria y Forestal (CENTA),
-c) Direccion de Sanidad Animal y Vegetal,
-d) Direccion de Recursos Naturales (DRN), y por el
-e) Centro de Desarrollo Pesquero (CENDEPESCA).

5.- Nivel de Unidades Descentralizadas.
Esta constituido por las siguientes Unidades Autonomas:
-a) Escuela Nacional de Agricultura (ENA),
-b) Instituto Regulador de Abastecimientos (IRA),
-c) Instituto Salvadoreño de Transformacion Agraria (ISTA),
-d) Financiera Nacional de Tierras Agricolas (FINATA),
-e) Banco de Tierras (BDT), y por el
-f) Banco de Fomento Agropecuario (BFA)

II.- CONSEJO NACIONAL DEL MEDIO AMBIENTE (CONAMA)

Los presidentes del Itsmo Centroamericano se reunieron el 12 de diciembre de 1989 en San Jose, Costa Rica. En dicha reunion firmaron un convenio por medio del cual quedaba constituida "La Comision Centroamericana de Ambiente y Desarrollo (CCDA)", integrada por los gobiernos de cada pais; con el objeto de impulsar

un modelo de desarrollo sostenible basado en el respeto de medio ambiente; que propicie un mejor nivel y calidad de vida a los habitantes de la zona.

En atencion al CCDA, el Gobierno de El Salvador, consciente de la necesidad de contar con un plan especifico para recuperar el equilibrio ecologico y de coordinar la accion a nivel nacional, creo por medio del Decreto Ejecutivo No. 73, firmado el 18 de diciembre de 1990 y publicado en el Diario Oficial el 14 de enero de 1991, el Consejo Nacional del Medio Ambiente (CONAMA).

El Consejo Nacional del Medio Ambiente esta integrado por los ministros de: Agricultura y Ganaderia, Salud Publica y Asistencia Social, Justicia, Hacienda, Obras Publicas, Planificacion y Coordinacion del Desarrollo Economico y Social, Economia, Defensa y Seguridad Publica, Educacion , Interior, Trabajo y Prevision Social y Relaciones Exteriores, Representantes de la Presidencia; un Representante del Instituto Salvadoreño de Desarrollo Municipal (ISDEM). El CONAMA es precidido por el Ministro de Agricultura y Ganaderia y en su ausencia, por el Viceministro del Ramo

El mandato de CONAMA es velar por la optima y racional utilizacion de los recursos naturales, el control de la contaminacion ambiental y el restablecimiento del equilibrio ecologico; para ello, el CONAMA propondra politicas y estrategias que porpicien el desarrollo sostenido de la proteccion de los recursos naturales y del medio ambiente. CONAMA ejecuta su mandato por medio de la Secretaria Ejecutiva del Medio Ambiente (SEMA).

III - SECRETARIA EJECUTIVA DEL MEDIO AMBIENTE (SEMA)

1 1 Funciones y Responsabilidades
1 2 Organizacion
1 3 Aspectos Administrativos y Financieros
1 4 Equipamiento
1 5 Recursos Humanos
1 6 Limitantes
1.7 Oportunidades de reforzamiento institucional

IV - CENTRO DE DESARROLLO PESQUERO (CENDEPESCA)

Funciones y Responsabilidades

Contribuir al desarrollo y ordenacion del subsector pesquero, mediante la formulacion de planes, politicas y estrategias orientadas a conservar proteger y garantizar el aprovechamiento racional y optimo de los recursos pesqueros a traves de la investigacion y transferencia tecnologica administrativa y ordenamiento pesquero.

Los principales objetivos de la institucion para 1992 son los siguientes:

1.- Dictar y aplicar normas tecnicas para el ordenamiento de la actividad pesquera.
2.- Transferir tecnologia a usuarios de la pesca y acuicultura.
3.- Determinar el stock disponible de pesca optimo en especies de valor comercial, marinos y continentales.
4.- Controlar la calidad de los productos pesqueros para consumo interno y para la exportacion.
5.- Efectuar pruebas en operaciones de recursos pesqueros subutilizados y nuevos de agua marina y continental
6.- Propiciar la utilizacion eficiente de la infraestructura pesquera.

Organizacion

CENDEPESCA esta compuesta por un director, una subdireccion y tres comisiones ; la Comision Nacional de Pesca, una Comision de Becas y un Consejo Consultivo. En cuanto a Cooperacion Internacional, exiten dos tipos de proyectos; el Proyecto Prodesca que esta financiado por la Comunidad Economica Europea y el proyecto regional de apoyo al desarrollo de la pesca en el itsmo centroamericano, financiado por la Agencia Noruega para el Desarrollo.

A nivel asesor existen tres departamentos; el departamento de auditoria , el departamento juridico y el departamento de planificacion.

A un nivel de apoyo existen cuatro departamentos; el departamento de informacion y divulgacion tecnica, de ingenieria , administrativo y de personal.

Es al nivel tecnico normativo donde se sustenta el objetivo por el cual ha sido creada CENDEPESCA, dicho objetivo se sustenta en tres divisiones : la Division de Investigacion; cuya funcion es detectar la existencia de biomasa, es decir cuanto existe en el pais de un recurso total. La Division de Administracion Pesquera encargada de la fiscalizacion del producto capturado de tal manera que cumpla con el tamaño requerido para ser consumido, supervision del tipo de red que se debe de utilizar (segun la Ley de Actividades pesqueras) , tambien esta unidad es la encargada de la supervision de las plantas procesadoras de pescado asi como de la administracion de los recursos pesqueros y de llevar un control estadistico de la produccion pesquera. La division de Capacitacion y de Transferencia Tecnologica encargada de la investigacion y transferencias de tecnologias pesqueras de los centros de investigacion a los pescadores.

Aspectos Administrativos y Financieros

No fue posible obtener el detalle de gastos a nivel de division puesto que el presupuesto de CENDEPESCA es calculado a nivel de

clase general de gasto y no en base a las necesidades de cada division.

Clase General de Gasto/92.	Asignacion
Sevicios Personales	¢ 1,634,410.
Otros Servicios Personales	3,607,630.
Servicios no Personales	237,500.
Maquinaria y Equipo	325,780.
Total	5,894,920.

CENDEPESCA recibe fondos de tres fuentes de financiamiento:

A) Fondo General de la Nacion· Presupuesto 92, ¢5,894,920.

B) Fondos Provenientes del Plan de Reconstruccion Nacional Agropecuario; por un total de ¢1,000,000 orientado hacia cuatro areas principales:

1.-Rehabilitacion de Estanques Comunales.
2.-Construccion y Manejo de jaulas y Corrales
3.-Manejo y Construccion de Modelos Productivos para el Aprovechamiento de la Tilapia.
4.-Establecimiento de Modelos Productivos para el Cultivo de Curiles.

C) Fondos de Presupuesto Extraordinario para la Reactivacion Economica. (PERE-SETEFE/MIPLAN) 1992 con un total de ¢500,000. orientados al apoyo al Desarrollo del Cultivo del Camaron en El Salvador.

D) Fondos de Cooperacion Internacional: Mision China, con un total de $ 37,000 para el cultivo del Camaron PRADEPESCA con un total de $45,250 para el cultivo del Camaron. USAID, con un total $90,000 para la Proteccion de las Tortugas Marinas en El Salvador.

Proyectos Regionales

OLDEPESCA ,Proyecto Regional de Apoyo al desarrollo Pesquero de Centroamerica y Panama, $13,400,000 .
FAO, Apoyo a las actividades de Acuicultura en America Latina y el Caribe AQUILA 2da. Fase.

No obstante todo el apoyo que aparece en cooperacion internacional casi ninguno se ha realizado, o si se realiza la ccoperacion es muy lenta.

Equipamiento:

A) -Laboratorios

1.-Izalco, Sonsonate (en estado deteriorado)
2.-Santa Cruz Porrillo, San Vicente

3.-Puerto el Triunfo, Usulutan (deteriorado)
4.-Estacion de Maricultura el Zope (en muy buenas condiciones, financiado por la Mision China bajo el Proyecto Apoyo al Cultivo del Camaron en El Salvador)
5 -Lago de Ilopango (San Salvador).

B).-Muelles

1.-Muelle de Pesca Artesanal en Acajutla.
2.-Muelle de Pesca Artesanal en La Libertad. y
3.-Muelle de Pesca Artesanal en El Triunfo.

C).-Vehiculos

Para realizar el trabajo de campo existen nueve vehiculos en total, dos de los cuales estan en buenas condiciones (uno donado por el Gobierno de Corea y el otro donado por la FAO para un proyecto que ya finalizo en la Herrradura, departamento de La Paz); el resto de vehiculos se encuentran en malas condiciones.

Recursos Humanos

El total de personal contratado por CENDEPESCA es de 253 personas en las siguientes categorias :

Area de trabajo	Porcentaje.
1.-Directivos	1.
2.-Tecnicos (de las tres divisiones claves, juridico y auditoria)	27.
3.-Administrativo (secretarias, bachilleres en comercio, contadores)	52.
4.-Apoyo (Serv. grales, cadeneros,peones)	20.
Total	100.

El 27% del personal que labora en CENDEPESCA se dedica a la investigacion y transferencia de tecnologìa y el resto, a actividades administrativas, de auditoria o de mantenimiento.
El promedio de tiempo que tiene un empleado de trabajar para CENDEPESCA es de cinco años como minimo y un tiempo maximo de treinta años.
Del total de personal tecnico que es de aproximadamente 68 personas de un total de 253, se puede clasificar a los profesionales de la siguiente manera:

Especialidad	No de profesionales.
1.-Bachiller en Navegacion y pesca.	5
2.-Biologo marino	4
3.-Licenciado en Biologia	16
4.-Tecnico en Acuicultura	8

Total 33

Existe muy poco personal especializado a nivel de las tres divisiones dada la responsabilidad que existe a nivel de CENDEPESCA a nivel nacional.

En cuanto al tipo de capacitacion que ha recibido el personal durante los años 90-91 y 91 -92 se puede obsertvar que se centro principalmente en el pequeños cursos de capacitacion pesquera con una duracion promedio de una semana, y en congresos de Control de Calidad de productos pesqueros. En cuanto a cursos de especializacion a nivel de maestria no ha habido mayor cantidad de becarios. Al parecer el problema principal es que las propuestas de becas llegan primero a la oficina de Cooperaccion Internacional en el Ministerio de Agricultura y no son enviadas a CENDEPESCA.

La mayoria de personal tecnico es personal que ha obtenido muchos conocimientos pero en la practica del diario trabajo.

Limitaciones

Bajo Presupuesto que se revierte en falta de apoyo logistico, bajos salarios (el promedio de salario para un profesional esta por los ¢ 2,000.)
Descoordinacion en la planificacion de actividades y la ejecucion.
Poca vision de los planificadores en cuanto a la importancia de la actividad pesquera.

Necesidades Expresadas

A)-Capacitacion:

Las necesidades de Capacitacion han sido detectadas a nivel de cada una de las tres divisiones principales para el recurso pesca:

1) Division de Investigacion Pesquera.

Tres maestrias en Manejo de Pesquerias.
Tres Maestrias en Acuicultura
Dos maestrias en Procesamiento de Productos Pesqueros.
Cursos (de tres meses minimo)
-Icteologia
-Dinamica de Poblacion Pesquera
-Diseños Experimentales para Cultivo y Produccion Pesquera.
-Computacion
-Ecologia Marina y Estuarios.
-Identificacion y Medicion de Plancton.
-Medios Electronicos de Pesca.
-Cultivo de Moluscos tanto en produccion como engorde
-Reproduccion Inducida de Peces

2) Division de Capacitacion

Maestrias en Extension Pesquera

Cursos (de tres meses minimo)
-Organizacion de Cooperativas Pesqueras.
-Administracion de Cooperativas Pesqueras.
-Comercializacion Pesquera

3) Division de Administracion Pesquera.

3 en Tecnologia en Embarcaciones Pesqueras
7 en Tecnologia en Artes Pesqueras
1 Curso sobre Construccion en Embarcaciones Pesqueras

4) Departamento Juridico.
Maestria en Legislacion Pesquera.

5) Departamento de Planificacion

Maestrias en Planificacion Pesquera
Formulacion y Evaluacion de Proyectos Pesqueros.

6) Asistencia Tecnica:

Reproduccion Inducida e Intensiva de Peces
Cultivo de Moluscos
Ictiología
Dinamica de Poblaciones Pesqueras
Cultivo de Peces en Jaulas y Corrales
Organizacion y Extension a Comunidades Pesqueras
Ecologia Marina
Bosques Salados.

Oportunidades de reforzamiento

El objetivo del Centro de Desarrollo Pesquero (CENDEPESCA) es el de "Contribuir al desarrollo y ordenacion del subsector pesquero, mediante la formulacion de planes, politicas y estrategias orientadas a conservar proteger y garantizar el aprovechamiento racional y optimo de los recursos pesqueros a traves de la investigacion y transferencia tecnológica administrativa y ordenamiento pesquero".

En ese sentido se podria reforzar esta institucion en lo siguiente:

a) Mejorar el sistema de evaluacion y monitoreo de la situacion de los recursos pesqueros, a fin de determinar los stocks disponibles de pesca, llevar un registro estadistico de los recursos y dictar las normas correspondientes.

b) Mejorar la capacidad fiscalizadora de los productos capturados asi como de la metodologia utilizada.

c) Establecimiento de proyectos pilotos en donde se analicen tecnicas apropiadas y efectuar pruebas en operaciones de recursos pesqueros.

d) Mejoramiento de la capacidad administrativa y tecnica de la institucion a fin de poder cumplir a cabalidad sus funciones.

A nivel de areas seleccionadas CENDEPESCA puede jugar un rol importante llevando a cabo el monitoreo de calidad de las aguas de los rios y determinando el grado de contaminacion. Este aspecto podria representar un indicador de las tecnicas que se aplican bajo el Proyecto Por otro lado, CENDEPESCA podria colocar una oficina de inspeccion pesquera, la cual no solo controlaria la pesca pero tambien llevaria registros estadisticos de impactos en el recurso pesquero. Ademas podria efectuar analisis socio economicos de la actividad pesquera en las areas seleccionadas La capacitacion, asistencia tecnica y equipamiento estaria acorde a este rol que le tocaria desempeñar.

Segun lo expresado por el actual Director de CENDEPESCA, la prioridad en asistencia tecnica consistiria en proporcionar asesores tecnicos en materias de : Reproduccion Inducida e Intensiva de Peces, Cultivo de Moluscos, Ictiologia, Dinamica de Poblaciones Pesqueras, Cultivo de Peces en Jaulas y Corrales, Organizacion y Extension a Comunidades Pesqueras, Ecologia Marina y Bosques Salados. En cuanto a la capacitacion, se manifesto como prioridades cursos de maestrias en manejo de pesquerías, acuicultura, extension pesquera y procesamiento de productos pesqueros. El equipamiento consistiria basicamente en equipos de monitoreo del recurso pesquero.
Uno de los mayores problemas que viene afrontando CENDEPESCA es la falta de presupuesto de operaciones y personal capacitado.

CENDEPESCA a traves de sus inspectores de pesca llevan las estadisticas de pesca en el litoral. Asi mismo, por ley le corresponde efectuar el monitoreo sobre la calidad de las aguas en los rios, lagos y mar. Lamentablemente por falta de recursos no lo vienen efectuando. Sin embargo tienen la capacidad tecnica para realizarlo, mas aun, acaban de completar un estudio de esta indole en la zona de El triunfo.

V.- DIRECCION DE RECURSOS NATURALES (DRN)

Funciones y Responsabilidades

Contribuir a preservar y desarrollar la productividad de los recursos naturales renovables, a traves de la emision y aplicacion de normas que regulen su conservacion y buen manejo

Especificamente, presenta las siguientes funciones:

a). Definir una politica basica que sea apropiada a las necesidades nacionales.

b). Coordinar actividades con las entidades publicas y privadas que tienen intereses relacionados con los recursos naturales,

para obtener su apoyo

c). Dirigir los procesos de modernizacion de las dependencias subordinadas relacionadas con la politica sectorial del MAG.

d) Contribuir a la conservacion y desarrollo de los recursos naturales. suelo, agua, flora y fauna.

Organizacion

La Direccion de Recursos Naturales cuenta con oficinas de Administracion, Juridica, de Planificacion, Auditoria y Comunicaciones. Asi mismo, presenta tres sub direcciones tecnicas:

a) Centro de Recursos naturales (CENREN), dividida en Ordenamiento de Cuencas Hidrograficas, Forestal y Parques Nacionales y Vida Silvestre.

b) Meteorologia e Hidrologia, dividida en Meteorologia, Hidrologia, Laboratorio de Medio Ambiente y Servicios Basicos y

c) Riego y Drenaje, dividida en Departamento Juridico, Departamento de Planificacion, Departamento de Auditoria Interna, Departamento Administrativo, Departamento de Comunicaciones, Divicion de Ingenieria, Division de Desarrollo de Sistemas de Riego, Oficina Coordinadora del Programa Nacional de Riego y Drenaje, Programa de Desarrollo Agricola del Distrito de Riego y Avenamiento No. 3 Lempa Acahuapa, Oficina del Proyecto de Fomento de Agricultura de Regadillo y Servicios de Atiocoyo, y Oficina del Proyecto de Control de Inundaciones del Rio Grande de San Miguel.

El CENREN tiene como objetivo fundamental: Garantizar la permanencia y conservacion de los Recursos Naturales para su aprovechamiento adecuado, diversificado y sostenido de acuerdo a su capacidad productiva y utilizacion optima en funcion del desarrollo integral de la Nacion.

La Sub Direccion Tecnica de Meteorología e Hidrologia tiene como objetivo lo siguiente. Satisfacer las necesidades de informacion basica y procesada en materia de Meteorologia, Hidrologia y calidad del ambiente fisico y cubrir las demandas actuales y potenciales de los sectores economicos y productivos del pais, asi como contribuir a la proteccion de la poblacion, bienes e infraestructura.

La Sub Direccion Tecnica de Riego y Drenaje, presenta como objetivos lo siguiente Contribuir a la ampliacion de la frontera agricola del pais, a traves del fomento de la tecnologia del riego y drenaje que permita la utilizacion racional de los recursos agua, suelo, con el proposito de mejorar la calidad de vida de los agricultores.

Aspectos Administrativos y Financieros·

Asignacion Presupuestaria

1.-Oficina de la DRN	297.180
2.-Meteorologia e Hidrologia	4,418.770
3.-Riego y Drenaje	5,530.900
4.-CENREN	14,899.060
Total del Programa	25,145,910

Clases Generales de gasto:

Servicios personales	20,450,910
Servicios no personales	1,241,090
Materiales y suministros	3,453,910
Total	25,145,910

Recursos Humanos

La Direccion de Recursos Naturales Renovables cuenta con 1,038 empleados. Del total, 3 pertenecen a la Oficina de la Direccion (DRN), 224 a la Sub Direccion Tecnica de Meteorologia e Hidrologia, 244 a Riego y Drenaje y 567 de CENREN.

El personal podria ser clasificado en las siguientes categorias:

Tecnicos
Administrativos
Apoyo

Limitantes

La funcion principal de la Direccion de Recursos Naturales Renovables es la de contribuir a preservar y desarrollar la productividad de los recursos naturales renovables, a traves de la emision y aplicacion de normas que regulen su conservacion y buen manejo

Segun lo manifestado por los representantes de la DRN, existe un ambiente favorable en el GOES para los aspectos medio ambientales. El Presidente asi como el Ministro de Agricultura otorgan prioridad a los aspectos de la conservacion de los recursos naturales. Asi mismo se manifesto que la tendencia es reducir el papel del Estado en cuanto a la administracion de los recursos naturales. Sin embargo, se reconoce que existe una falta de coordinacion entre las dependencias del Estado en materia de recursos naturales creando en algunos casos confusion y duplicidad de esfuerzos.

A nivel nacional se adolece de una vision global de la problematica ambiental. Por tal motivo es imprescindible contar con una estrategia nacional del medio ambiente. A partir de esta estrategia se definirian las politicas Ej politica forestal, de recursos naturales etc.

Se manifesto, que el desarrollo forestal y la conservacion de áreas protegidas serian aspectos que el GOES otorgaría prioridad, para un posible apoyo del proyecto PROMESA. Tomando en cuenta lo manifestado, nos concentramos en estos dos aspectos:

Desarrollo Forestal - Inicialmente se necesita definir una politica forestal a partir de la cual se pueda impartir dispositivos legales los cuales sean mas de fomento que "controlistas". Es necesario incentivar al sector privado en la reforestacion y actividad forestal. En la actualidad se viene redefiniendo el rol del Estado. La tendencia es hacer participar al sector privado y lograr la participacion de un sector mas amplio de la poblacion. La orientacion es hacia el pequeño agricultor. En El Salvador no existen propiedades mayores de 245 Has.

Existen diagnosticos en los cuales se determina que en 15 años desapareceran los bosques en El Salvador Es necesario plantar alrededor de 14,000 Has. al año para revertir este proceso a un costo aprox. de $ 800 por Ha. En el pais se consume alrededor de 4,700,000 m3 de leña al año.

Se viene modificando la Ley Forestal y se espera la llegada de Tschinkel y Guillen de ROCAP, quienes proporcionaran asistencia tecnica. Se tiene pensado que la nueva ley forestal sea mas de fomento y promocion Se necesita asistencia tecnica en los aspectos legales y de diseño de una politica de incentivos forestales. Asi mismo, se cree por conveniente capacitar capacitadores de extension forestal

Las actividades de reforestacion se encuentran limitadas dada la falta de capacidad instalada en recoleccion de semillas, almacenamiento, certificacion y distribucion de las mismas. Se viene impartiendo un ciclo de conferencias a los alcaldes a fin de poder crear/establecer los viveros comunales.

Conservacion de areas protegidas - La prioridad en este sector, es la regularizacion del status legal de las areas propuestas para ser protegidas. En la actualidad existen aproximadamente entre 104 a 114 areas seleccionadas. De estas, 62 cuentan con aprobacion de Junta Directiva y 42 de estas con aprobacion de Consejo de Ministros. Las areas propuestas finalmente para estar legalmente constituidas deben ser inscritas en el Registro de Propiedad del Estado Para este aspecto es necesario contar con los recursos financieros para contratar abogados que efectuen este tramite legal. Asi mismo es necesario delimitar las areas en el terreno haciendo una demarcacion fisica. Posteriormente será necesario categorizar estas areas y definir el objetivo por la cual son establecidas i.e proteccion, manejo etc.

Ademas de la necesidad de contar con asistencia tecnica para la regularizacion del status legal de las areas seleccionadas y para la categorizacion de las mismas, se manifesto la necesidad de contar con asistencia tecnica permanente en la Direccion de areas protegidas y en la revision de los anteproyectos de leyes de

proteccion y manejo de vida silvestre y la de manejo de áreas naturales Asi mismo, asistencia tecnica en la elaboracion de los reglamentos correspondientes para la leyes mencionadas.

En cuanto a la capacitacion se indico como prioridad la capacitacion al personal de mando medio, fundamentalmente en aspectos de planes de manejo y administracion de areas protegidas. Asi mismo se menciono la necesidad de capacitar a los guardaparques en tecnicas de patrullaje y vigilancia.

Referente al aspecto de **Meteorologia/Hidrologia**, se manifesto que atraviesan por un serio problema ocasionado por el conflicto belico y por la fuga de personal capacitado. En la actualidad no existe ningun hidrologo en la Sub Direccion Tecnica. Cuentan con 48 estaciones climatologicas, mas 60 pluviometros distribuidos en todo el pais. Llegaron a existir 50 hidrometros, ahora solo cuentan con 18. Se manifesto que dado el incremento de proyectos asi como la demanda de estudios de impactos ambientales, se esta creando una demanda de informacion meteorologica. A pesar de existir informacion que en forma continua se ha venido colectando por muchos años, el analisis, asi como sus publicaciones, se dejaron de producir en 1975.

Otros - El actual Director de la DRN manifesto la necesidad de estar informado de todos los proyectos relacionados con los recursos naturales. Ademas considero que la DNR debería aprobar y supervisar los proyectos sobre recursos naturales. Sin embargo reconocio no contar con la capacidad para efectuarlo. Asi mismo manifesto estar interesado en actividades de seguimiento y evaluacion de los recursos naturales.

Necesidades Expresadas

Segun lo manifestado por el Director de Recursos Naturales, cualquier tipo de apoyo debe de empezar desde el principio. Tener una vision global a traves de el diseño de una estrategia, luego definicion de politicas y posteriormente elaboracion de planes de accion. Caso contrario se estaria propiciando un desarrollo no coordinado desde un punto de vista global/nacional.

En el aspecto de **desarrollo forestal**, se estaria a la espera de la asesoria de Tschinkel y Guillen Sin embargo, segun lo manifestado, la asistencia tecnica se concentraria en determinar la politica forestal a nivel nacional y la modoficacion de la Ley Forestal la cual estaria mas orientada hacia el fomento que el control.

En lo que respecta a la **conservacion de las áreas protegidas**, en el **ambito nacional la asistencia tecnica** solicitada puede concentrarse en la consolidacion del status legal de las areas protegidas, categorizacion y planes de manejo de las mismas. Por otro lado colaborar en el diseño de estrategias, dispositivos legales y definicion de politicas tanto forestales como de los recursos naturales en general. En el **ámbito de las áreas seleccionadas la asistencia tecnica** puede concentrarse en el manejo y administracion

de las areas protegidas así como de los recursos naturales. Para esto sera necesario aumentar la presencia del estado en estas areas.

En lo referente a **nivel nacional**, se podria capacitar al personal en los siguientes aspectos que les permitan desempeñar mejor su rol de entidad tecnico normativo:

-Politica y administracion de recursos naturales y areas protegidas.
-Elaboracion de planes de manejo.
-Planificacion estrategica.
-Evaluacion y seguimiento de proyectos.
-Gestion y elaboracion de propuestas.
-Alcances de los dispositivos legales vigentes a nivel nacional e internacional
-Delimitacion, demarcacion, y zonificacion de areas protegidas
-Talleres sobre liderazgo.
-Experiencias de otros paises sobre administracion de sistemas nacionales de areas protegidas.
-Evaluaciones ecologicas rapidas.

A **nivel local** se podria capacitar a los **administradores de las áreas protegidas** en lo siguiente:

-Aspectos gerenciales y administrativos.
-Administracion de personal.
-Relaciones publicas y trato con las comunidades aledañas
-Tecnicas y estrategias de manejo de áreas de amortiguamiento
-Tecnicas sobre educacion e interpretacion ambiental.
-Conceptos sobre arquitectura paisajistica
-Conceptos sobre diseño de infraestructuras turisticas.
-Tecnicas para determinar las capacidades de carga de las areas.
-Diseño y construccion de senderos, señales, servicios etc
-Campañas de prevencion y control de incendios
-Manejo de concesion de servicios.
-Estrategias de control, patrullage y vigilancia
-Procedimientos de captura y denuncia de infractores.
-Primeros auxilios
-Tecnicas de busqueda y rescate
-Programas de mantenimiento y reparacion de equipos.
-Revisión y analisis de actuales dispositivos legales
-Uso y manejo de ayudas audiovisuales
-Preparacion de reportes e informes, tecnicos y financieros
-Aspectos financieros, contables.
-Cursos basicos sobre manejo de los recursos de acuerdo al lugar donde se encuentren.
-Analisis y toma de datos estadisticos i.e afluencia de visitantes, demanda, impactos observacion de flora y fauna indicadoras.
-Tecnicas de evaluacion ecologica rapida.

Para los **guardaparques y guardaforestales** se podrian capacitarlos en lo siguiente:

-Revision, analisis, derechos, obligaciones, sanciones de los actuales dispositivos legales.
-Sistemas de vigilancia y control
-Busqueda y rescate
-Tecnicas de recoleccion de muestras y toma de datos.
-Primeros auxilios
-Reparacion y mantenimiento de motores pequeños
-Cursos de supervivencia
-Control y prevencion de incendios
-Tecnicas de interpretacion y conduccion de grupos.
-Reparacion, construccion y mantenimiento de infraestructura basica.
-Carpinteria basica
-Conceptos sobre manejo de areas y vida silvestres
-Principios basicos de contabilidad.
-Principios basicos de identificacion de especies.
-Lecturas de mapas y levantamientos topograficos
-Trato al turista.

En lo referente al **equipamiento**, fundamentalmente consistiria en vehiculos (motos, botes y/o carros), equipos de radio, de carpinteria, de prevencion y control de incendios, de mantenimiento y mecanica, equipo de campo (brujulas, binoculares, carpas, uniformes, mochilas etc.). En algunos casos cuando la situacion lo amerite se vera la conveniencia de equipar las areas con centros de administracion/visitantes, senderos, letreros y otros. Condicion previa a estas inversiones sera el contar con planes de manejo que regulen el desarrollo del area. Asi mismo, el GOES debera asumir los gastos de operacion que demande estas actividades.

Oportunidades de reforzamiento

El objetivo de la DRN es el de "coordinar y evaluar el conjunto de acciones tendientes al uso y desarrollo sostenible de los Recursos Naturales, mediante la utilizacion de tecnicas adecuadas a la realidad nacional con el proposito de contribuir en la produccion agropecuaria."

A fin de poder cumplir con el objetivo descrito, se considera prioritario reforzar la institucion en lo siguiente:

a) Evaluacion y monitoreo de la situacion de los recursos naturales Creacion de un sistema de recopilacion de informacion, procesamiento, analisis y distribucion. Esta informacion no solo permitira impartir normas pero tambien podria servir de sustento para la gestion de politicas ambientales.

b) Mejorar la capacidad de hacer cumplir las leyes referente a los recursos naturales. Capacitacion e implementacion del servicio de guardabosques y agentes forestales. Consolidacion de la presencia estatal en los lugares requeridos y prioritarios

c) Mejorar la capacidad de manejo de las areas protegidas y consolidar el establecimiento de las areas propuestas.

d) Establecimiento de proyectos pilotos en donde se analicen tecnicas apropiadas sobre: conservacion de suelos, tecnicas silviculturales, manejo de cuencas, manejo de fauna silvestre, manejo de manglares y recursos costeros.

e) Mejoramiento de la capacidad administrativa y tecnica de la institucion a fin de poder cumplir a cabalidad su funcion normativa.

V.- CENTA

Funciones y Responsabilidades:

Contribuir al incremento de la produccion y productividad del Sector Agrario y Forestal, mediante la generacion de tecnologia apropiada, a fin de posibilitar la satisfaccion de las necesidades alimentarias de la poblacion, de las exportaciones y de la agroindustria local. Como funciones especificas

a). Asesorar al Ministerio de Agricultura y Ganaderia en la formulacion de la politica de desarrollo tecnologico agropecuario.

b). Ejecutar la politica nacional de desarrollo tecnologico-agropecuario y coordinar la investigacion y transferencia de tecnologia agropecuaria y forestal con el sector privado.

c). Generar, validar, ajustar y transferir tecnologia agropecuaria y forestal.

d). Prestar la asistencia tecnica, gratuita o subsidiada a los pequenos productores agropecuarios.

e). Divulgar los logros y resultados de la investigacion generada en el pais o introducida.

Organizacion

El Centro de Nacional de Tecnologia Agropecuaria (CENTA) esta compuesta por una Direccion General la cual cuenta con oficinas de Director, sub director, planificacion, Depto. Juridico, Gerencia Administrativa.

A nivel operativo, existen divisiones de Investigacion Agricola, Investigacion Pecuaria, Extension Agricola, Tecnologia de Semillas, Certificacion de Semillas y plantas e Investigacion Forestal

A nivel de apoyo, estan los departamentos de comunicaciones y de operaciones de campo.

A nivel nacional cuentan con estaciones experimentales (5), Centros Regionales y Agencias de Extension (75).

La division de Investigacion Agropecuaria tiene como objetivo: Generar y validar tecnologia apropiada para pequenos y medianos productores, con enfasis en la seguridad alimentaria, la diversificacion de cultivos y el desarrollo pecuario, mediante acciones que conduzcan al aprovechamiento integral y sostenido de los recursos productivos.

La division de Extension tiene como objetivo: Proporcionar a pequenos y medianos productores agropcuarios, la capacitacion y asistencia tecnica necesaria a fin de contribuir al incremento de su productividad e ingreso.

La division de Tecnologia de semillas tiene como objetivo Contribuir al incremento de la produccion agricola mediante la presentacion, conservacion y uso del material genetico y semillas fundamentales en el proceso de investigacion, tendientes a conformar variedades de alta productividad para cultivos de subsistencia y exportacion.

Aspectos Administrativo y Financieros:

Asignacion Presupuestaria:

Investigacion Agropecuaria	22,961,260
Extension Agropecuaria	34,086,870
Tecnolgia de semillas	3,005,400
Total	60,053,530.

Clases Generales de Gasto:

Servicios personales	50,787,190
Servicios no personales	2,421,880
Materiales y suministros	7,170,840
Total	60,053,530

Recursos Humanos.

En cuanto a los recursos humanos, se contempla dos aspectos especificos: a) Personal tecnico y Administrativo, y b) Capacitacion recibida.

CENTA cuenta con 853 personas, de las cuales 699 corresponden al

personal administrativo y de servicio y 154 al personal tecnico, existiendo una relacion de 5 a 1 entre ellos.

En su mayoria el personal tecnico esta formado por ingenieros agronomos (86), de los cuales solo 8 de ellos poseen el grado de Maestria; ademas cuenta con 26 agronomos y 42 tecnicos de diferentes profesiones.

El personal administrativo y de servicio, que en su mayoria no cumple con los estudios basicos, tiene un 25% de personas analfabetas, muchos de ellos trabajando en el campo y en algunos casos, desempenan funciones de ordenanza.

El alto porcentaje del personal administrativo y de servicio, origina un problema ocupacional a la institucion, disminuyendo el rendimiento tecnico de la misma, ademas de ocasionar un alto monto salarial, que generalmente son financiados por Ley de Salarios, contratos GOES Y sistemas de jornales.

Casi el 89% de los fondos para el personal lo cubre el GOES, el resto es responsabilidad de fondos de proyectos existentes, los cuales son temporales y como tales, ocasionan una inseguridad laboral al personal beneficiado, que en su mayoria son ingenieros agronomos.

Limitantes

El CENTA tiene como funcion el contribuir al incremento de la produccion y productividad del Sector Agrario y Forestal, mediante la generacion de tecnologia apropiada, a fin de posibilitar la satisfaccion de las necesidades alimentarias de la poblacion, de las exportaciones y de la agroindustria local.

El CENTA tiene bajo su mandato, recientemente asignado, la investigacion y extension forestal, asi como la conservacion de suelos. En la actualidad cuentan con 76 agencias de extension en todo el pais y necesitan establecer 4 mas para tener una cobertura total. Cada agencia cuenta en promedio con 4 extensionistas siendo lo optimo 8. Del presupuesto total mas del 95% se destina al pago de remuneraciones.

Manifestaron que el sistema de extension que se viene aplicando es la extension dirigida a objetivos "EDO". Si bien es cierto que reconocen haber incrementado la produccion en los lugares que se aplico, son consientes de las limitaciones y sobretodo que este sistema no es integral, estando dirigida fundamentalmente a la produccion de granos basicos

Al igual que otras dependencias del Estado, CENTA se encuentra en un proceso de reorganizacion. La orientacion es la de lograr una entidad autonoma, en donde se fomente una mayor participacion del sector privado Se tiene pensado efectuar una depuracion/reducción del actual personal, es decir una recategorizacion y nivelacion salarial.

A traves de un prestamo del Banco Mundial y otras fuentes financieras, CENTA viene implementandose. Sin embargo, este prestamo que no goza de condiciones favorables, puede ser reducido si se reciben donaciones de otras fuentes.

En el aspecto forestal, CENTA viene ejecutando proyectos agroforestales basados en la experiencia obtenida a traves del proyecto MADELEÑA Sin embargo, estos se encuentran limitados dado que en la actualidad no cuentan con el apoyo logistico adecuado. Es decir, adolecen de medios de transporte, infraestructura de recoleccion, almacenamiento, certificacion y transporte de semillas. Asi mismo, no cuentan con los medios para efectuar campañas masivas de difusion.

Oportunidades de reforzamiento.

En el ambito nacional, CENTA viene recibiendo apoyo de otras fuentes financieras, para lo cual cuentan con un plan de desarrollo y transferencia. El apoyo de PROMESA podria concentrarse en las areas seleccionadas por el proyecto. Fundamentalmente en estos lugares el apoyo posible seria en capacitacion a los extensionistas, asistencia tecnica sobre campañas de difusion masiva y cierto equipamiento para las labores de extension.

En las areas seleccionadas por PROMESA, CENTA cuentan con agencias de extension Seran los extensionistas los que puedan transmitir a la poblacion y sobretodo, a los agricultores, las practicas y sistemas que el proyecto desee implementar. Son los extensionistas, los que proporcionaran el "feedback" y grado de aceptacion de los agricultores en cuanto a sus habitos de cultivos. En ese sentido estan llamados a desempeñar un rol importante en la implementacion. Por tal motivo se solicito a los representantes de esta institución que nos proporcionen el listado de las agencias de extension que vienen laborando en las areas seleccionadas, indicando su ambito de trabajo y su capacidad instalada, tanto en recursos humanos como equipamiento.

VI.- CONCLUSIONES

1 CONCLUSIONES SOBRE LIMITANTES INSTITUCIONALS

1.1 Sabido es de las limitaciones que presentan las organizaciones del Estado Estas son mas significativas en los sectores relacionados a la administracion de los recursos naturales, las cuales, dada la situacion socio - economica, no gozan de la prioridad de los gobernantes. La falta de apoyo politico/financiero se traduce en una escasez de personal capacitado el cual no cuenta con las condiciones minimas para poder ejercer la funcion que les han encomendado. Las entidades del Gobierno son los administradores del recurso natural, lamentablemente no estan capacitados para ejercer una buena administracion.

1.2 Ademas de encontrarse desimplementados en muchos casos no existe coordinacion a nivel intersectorial e interinstitucional. Este aspecto trae consigo una duplicacion de esfuerzos y confusion sobre las responsabilidades asignadas, mas aun cuando los objetivos de cada una de ellas no estan bien definidos.

1.3 A fin de reforzar las principales organizaciones del Estado que tienen que ver directamente con la administracion de los recursos naturales, se debe de considerar entre otros, los siguientes aspectos:

a) La necesidad de fondos en estas entidades es un mal generalizado. El asignar un presupuesto para aspectos especificos y entidades seleccionadas no es garantia que estos lleguen a cumplir los fines a los que fueron destinados. Normalmente cualquier donacion ingresa a las cuentas nacionales las cuales posteriormente seran distribuidas de acuerdo a prioridades internas.

b) Las trabas burocraticas así como la falta de flexibilidad administrativa atrasan considerablemente la implementacion de proyectos.

c) Ninguna de las dependencias seleccionadas goza de autonomia administrativa. En ese sentido los aspectos de política salarial, contratacion de personal, gastos de operaciones etc. estan sujetas a la politica administrativa de todo el aparato Estatal

d) La politica salarial no permite en la actualidad pagar sueldos competitivos para poder contratar personal capacitado.

e) El tratar de modificar ciertos aspectos burocraticos con la finalidad de efectivizar estas dependencias, debera de contar con al apoyo/respaldo/compromiso politico, caso contrario no tendra ningun efecto lo propuesto.

VII- RECOMENDACIONES

1. RECOMENDACIONES SOBRE LA ESTRATEGIA DE IMPLEMENTACION

1.1 En primer lugar se debe analizar la posibilidad de firmar una carta de entendimiento/convenio con el GOES. Esta posibilidad permitiria lograr el compromiso del GOES en implementar en forma conjunta, algo que debe ser de mutuo interes. Requisito indispensable para la continuidad de estas actividades es lograr el interes del GOES de seguir financiando esta actividad En ese sentido el convenio estableceria la necesidad de asignar fondos de contrapartida que podrian provenir de la PL480 Con estos fondos se podrian pagar no

solo los gastos de operaciones de las entidades sino que tambien se podrian contratar personal. Caso contrario seria una situacion especial que a traves de gastos de donacion y administradas por una entidad privada se esten pagando gastos estatales ej. contratacion de personal, viaticos y gastos de operacion.

1.2 Por otro lado, el asignar fondos presupuestales de contrapartida es una muestra del grado de interes por parte del GOES. Las actividades a realizarse deberan estar en un plan operativo anual en donde se establezcan responsabilidades de implementacion y sobre todo los asignaciones presupuestales. Este plan sera aprobado por el GOES en lo que compete a fondos de contrapartida y la AID en lo que compete a donaciones. La entidad implementadora de PROMESA deberá de trabajar en forma coordinada con las agencias del GOES a fin de unificar criterios y prioridades que se reflejarian en el Plan Operativo.

1.3 Mediante esta modalidad de trabajo se logra el compromiso del GOES en algo que es de mutuo interes y sobretodo se elabora un plan conjunto que la agencia estatal lo hace suyo. Los esfuerzos del proyecto de esta manera no estaran aislados de los planes del GOES en aspectos medio ambientales.

1.4 Administrativamente la AID desembolsaria a la entidad ejecutora los fondos de donacion de conformidad a un calendario de gastos establecidos en el plan operativo. esta a su vez implementa lo que le compete y monitorea que la asignacion del GOES se cumpla de conformidad a lo establecido.

1.5 Las actividades que debera incluir los planes operativos seran los establecidos en el proyecto. Es decir, apoyo a la formulacion y gestion de politicas, monitoreo ambiental, educacion ambiental, reforzamiento en la aplicacion de las leyes ambientales, apoyo a la proteccion de areas naturales, apoyo a programas de extension y difusion ambiental. Dentro de estos marcos se propiciara la capacitacion del personal de las instituciones, se brindara asistencia tecnica en los aspectos que se consideren necesarios y se proporcionara los fondos para el equipamiento necesario.

1.6 La entidad ejecutora del Proyecto, dada su agilidad administrativa seria la encargada de adquirir el equipo y contratar los consultores, otorgar la capacitacion en servicio o en el exterior Por otro lado, el GOES a traves de las instituciones con que se este trabajando se compromete en asignar los fondos a tiempo, para el pago de los gastos operativos y salarios del personal.

1.7 Otro aspecto interesante de esta modalidad sera que cada una de estas instituciones, con la que se elaborarian los planes operativos, incrementarian sus asignaciones presupuestales significativamente, aspecto que no se podria haber logrado si

solo se los reforzara con donaciones, sin exigir una contrapartida.

1.8 El Proyecto, en lo que respecta a este componente, consistira en crear los mecanismos administrativos para reforzar estas instituciones. Los montos asignados estaran limitados a la factibilidad de implementar el plan operativo, asignacion de contrapartida, actividades acordes con los objetivos del proyecto, y desempeño de las instituciones e.j avance de las actividades.

1.9 Si bien es cierto que de esta manera el proyecto estaría mas limitado en su accionar y su exito dependera de la eficiencia del GOES, esta es una manera de lograr un verdadero reforzamiento y sobre todo mantener la continuidad de un sistema mejorado de la administracion de los recursos naturales en el sector Estatal.

1.10 El pretender trabajar con diferentes entidades del GOES, sin la existencia de un mecanismo de coordinacion entre ellas, sera aspecto determinante en la implementacion del Proyecto. A nivel nacional, existe la alternativa de tener diferentes proyectos para cada una de las instituciones o trabajar a traves de una de ellas que actue como coordinadora. Esta entidad a su vez debera de establecer los mecanismos de coordinacion con las ONGs, aspecto que en la actualidad no esta muy definido. SEMA podria cumplir este rol, dado que le compete la coordinacion de esfuerzos de todas las entidades involucradas en la administracion de los recursos naturales.

1.11 Otra alternativa es la de brindar asistencia tecnica a ciertas dependencias a nivel nacional i e SEMA y CENREN, e implementar a nivel de areas seleccionadas a otras dependencias que de una u otra manera puedan afectar el exito de Proyecto En este caso, CENTA, CENDEPESCA y CENREN.

1.12 A nivel nacional la asistencia técnica, equipamiento, y capacitacion, estarían orientadas a colaborar en la definicion de estrategias y politicas, asi como la elaboracion de los dispositivos legales pertinentes, que sirvan de marco a la administracion de los recursos naturales. En ese sentido, estaria concentrada basicamente en SEMA y CENREN.

1.13 A nivel de areas seleccionadas, la asistencia tecnica, capacitacion y equipamiento, estaria orientado al logro de los objetivos del proyectos. Posiblemente se concentraria en CENREN, CENDEPESCA Y CENTA.

1.14 Como es de conocimiento en la actualidad existe desconocimiento y descoordinacion entre las entidades del GOES SEMA, como entidad coordinadora, esta llamada a clarificar las funciones y responsabilidades de las entidades que en conjunto administran los recursos naturales. De continuar el camino ascendente de la Secretaría del Medio

Ambiente, un paso logico será el obtener cierto grado de independencia y consolidacion institucional. Quizas al lograr esta etapa, y tan solo en el plano expeculativo, como paso siguiente, seria el incluir a las dependencias ejecutoras, entre ellas CENREN y CENDEPESCA bajo esta administracion.

2. SUGERENCIAS DE APOYO/COLABORACION

2.1 El apoyo que se le pueda brindar a las organizaciones del estado, esta supeditado a un compromiso de ambas partes interesadas, es decir el GOES y la AID En el supuesto de firmarse un convenio y/o cartas de entendimiento, se deberan de establecer claramente los compromisos adquiridos por ambos.

2.2 Las sugerencias de apoyo/colaboracion que se indican, suponen de la existencia de fondos de contrapartida que permitiran cubrir los gastos de personal y de operaciones del proyecto.

2.3 El detalle de este apoyo deberia de establecerse anualmente en los planes operativos anuales. Estos planes podrian ser elaborados en forma conjunta entre el personal del proyecto y entidades del GOES En esta modalidad, se permite cierta flexibilidad y sobretodo un espiritu de colaboracion y responsabilidad compartida.

Annex E
Environmental Protection
519-0385

SOCIAL SOUNDNESS ANALYSIS

PROJECT BENEFICIARIES

Characteristics of the Rural Population

Though sharing many characteristics with other Spanish-speaking rural populations of Latin America, several features of the rural population of El Salvador set it apart even from its nearest neighbors In 1967, the labels for these salient features of the Salvadoran rural areas might have been demographic density, ethnic and linguistic ladinization, unequal land distribution, subsistence cultivation, low standard of living, violence None of these descriptors is or was unique to El Salvador But their confluence in a single country gave and still gives this society its special flavor While none of these descriptors has radically altered in the intervening quarter of a century, two new ones need to be added The violence endemic to Salvadoran culture has been worsened by a lengthy internal war which also generated a class of displaced refugees Although the land distribution remains skewed, the land reform has produced two unusual social types, the cooperative member, who crops collectively owned land, and the finatero, a small farmer

Demographic Density The previous national census in El Salvador was in 1971 and results of the October 1992 census are not yet available in February 1993. The Directorate of Statistics and Census estimates the current population at 5 25 million. Dispersed over El Salvador's 22,000 square Km, population averages 239 persons per km^2, the highest density for any country in Central America This isn't a recent phenomenon even in pre-colonial times, the Pipil, Nahua, and Lenca peoples in what is today El Salvador probably had the highest population density in Central America region

In 1900, the population was 783,000, or 36 per km^2 By 1961, these figures had risen to 2,570,000 persons and 117 per km^2 In three decades, the population attained today's 240 per km^2 Much of the unsustainable use of natural resources became evident during this period At current growth rates, the Directorate projects 11,299,000 persons, or 514 per km^2 by 2025 This level of demographic pressure has no parallel anywhere else in Central America. El Salvador has a high dependency ratio, with about half the population under 15 years old and a crude annual increase of over 3% Despite out-migration, this growth outstrips the capacity of agriculture alone to sustain the population Much of the migratory stream is internal. Refugees have fled from the Oriente to the lowlands of the west, while migration to the capital continues apace Metropolitan San Salvador could have nearly 2 million inhabitants by the year 2000.

Ethnic and Linguistic Features The Salvadoran population differs from its neighbors not only demographically, but also ethnically and linguistically Unlike Guatemala, many of whose indigenous groups are of Mayan extraction, the Pipil and Nahua peoples that inhabited El Salvador are more of Aztec derivation The Lenca were apparently related closely to neither. The absence of numerically important indigenous groups distinguishes El Salvador from Mexico, Guatemala, Panama, and Nicaragua Likewise, the relatively insignificant numbers of coastal Afro-Salvadorans distinguishes this country from most of the rest of Central America There is a higher percentage of racially mixed, monolingual, Spanish-speaking households in El Salvador than in any other Central American country The culture is homogeneously "mestizo" or "ladino" to a greater degree than in neighboring territories

Indicators of Poverty Open unemployment nationwide is estimated at about 7 5% of the workforce Nearly half the economically active population works in agriculture, 13% are in services, 8% are in manufacturing, and 7% in commerce In the late 1980s the inflation rate was over 30%, but in 1992, it had declined to 17%

Infant mortality has been declining, from 176 per thousand earlier this century to 60 in the 1980s Gastrointestinal disease due to contaminated water is a major cause of early childhood mortality, other major illnesses are bronchial infections, pneumonia, and tuberculosis. There are 29 hospital and health centers and 294 smaller posts and units. Half of the population has no access to potable water There are 3,000 public schools and about 15,000 teachers. Formal education is concentrated in the urban areas. A 95% enrollment rate for first grade has been reported, but 80% of enrolees drop out before 6th grade

Rural Land Tenure and Economic Structures El Salvador's traditional land tenure system, prior to the war, may have been the most skewed in all of Latin America The 1981 land reform turned over expropriated holdings of more than 300 hectares to groups of farmers who for the most part still work them collectively Only since 1991 have these farmers had the opportunity to choose the tenure under which the land is held. The later phase allowed renters to claim the small farms they had been renting if they could show three years' rent receipts Individuals in this group are called finateros, after the name of the government agency that oversaw the process Unlike the cooperative members, finateros live on and work their own plots, but they pay an annual mortgage to purchase that land from the State.

To a degree that is unusual in Central America and the Caribbean, Salvadoran small farmers practice a genuine subsistence economy, in the sense that they try to produce their year's supply of corn and store it on-farm In another sense, however, they have become deeply engaged in the cash economy They now regularly purchase fertilizer and other commercial inputs, even for their traditional milpa Basic grain produced on small farm is now a central part of the agricultural economy with many farmers supplementing their home production with cash wages earned as laborers on large farms About half of rural women engaged in some commercial microenterprise during their lifetime.

A related constraint is found in the radical disparity between the protection and conservation problem-definition used by most institutional personnel and the production and income problem-definition prevailing among the estuary and hillside population. The project must address the microeconomic agendas of

local communities, with macroecological payoffs as secondary effects This dilemma is generic to most projects of this type.

Rural Family Structures Marriage patterns vary by social class As expected, the wealthy have fewer children and often marry for economic advantage A pattern of extralegal unions prevails among the rural and urban poor Of such couples, it is said that "Viven asi no mas" or "estan acompañados" Such unions are stable in the rural areas, but less so in the urban areas Salvadoran women often do not have a prolonged relationship with the fathers of their children, leaving the women with sole responsibility for the children. Many women have several children, each with different fathers This situation is prevalent in the lowland parts of the demostration area, particularly where characterized by transience and migration. In the more traditional peasant communities near El Imposible Park, legal and ecclesiastical marriage seemed more common

Targeted Groups under the Project

General Characteristics of the Project Population A distinction must be made between the institution-building, policy, and education components on the one hand, and the demostration area activities on the other The policy and education components stand a good chance of spreading to every sector of the Salvadoran population. In contrast, demonstration area activities will deal with specific socioeconomic groups in a limited geographic region Project credibility will rest on the ability of Project-sponsored technology to induce measurable behavioral change in the demonstration area.

In El Salvador, a Department is subdivided into several municipios, each headed by a mayor. The municipio is in turn divided into several cantones, each headed by a mayoral delegate Cantones are further divided into caseríos The Barra de Santiago transect selected as the demonstration area is located in the department of Ahuachapán Activities in the Barra de Santiago will be carried out in communities of two municipios. San Francisco Menendez and Jujutla. Population estimates for the former is 42,360 (1988), 49% of whom are female and more than 95% rural The population of Jujutla is 27,165, with the same sex ratio and a similar level of rurality Actual population figures may be higher, since these estimates may not fully account for the refugees from the Oriente during the war Within the demostration area are discrete groups differing in occupational structure, land tenure, social organization, family structure, and value orientations Project activities must adapt to the technology, land tenure, and social organization of each

The Mangrove and Estuary Population of Barra de Santiago. A man born in Barra de Santiago in 1906 stated that, in his youth, the island was probably home to fewer than 100 people living in 20 houses At that time, too, there were still indigenous groups in the area. Even then, the environment was in a state of flux, propelled by climatological rather than anthropogenic events A hurricane in 1902 inundated the island. According the old man, at this time there were not yet any mangrove forests in the region In his recollection, they grew up in the wake of this natural disaster. He and his neighbors fished and gathered shellfish, but unlike now, the mainstay of the population was maize and some livestock Today, with an island population probably over 3,000, virtually everyone practices one or another variety of foraging activity -- marine estuary fishing and wood cutting.

This change has great potential relevance for the Project When the population was substantially smaller, subsistence was derived mostly from the land rather than the estuary and the sea. However, there has been a paradoxical anthropological regression to a more archaic form of resource exploitation, as turn-of-the-century farming and stockraising were replaced by the dependence on the extractive foraging that characterizes the present lifeways of the islanders. Today's foragers do not have deep historical roots in these lifeways. If they only relatively recently shifted out of farming, there is little reason to doubt that they could and would shift back into farming, given access to inputs and land But, what land? The land abutting the mangroves appears to be degraded pastures, formed when large landholders gradually expanded their pasturage by releasing their cattle into the adjacent mangrove forest.

The absence of clearly defined property rights over the resources exploited in estuary communities is more serious in marine settings than where cattle are grazed on common land The cattle themselves are privately owned, creating reasonably clear benefit expectations for capital or labor invested. In a marine setting, property rights are hard to establish over either the medium or resource itself Unlike the communal grazing rights cattle economy, there are few ways that the estuary or sea exploiter can hope to benefit personally from any species protection or propagation This constrains participation in many of the sustainable resource management activities which would be carried out in the mangrove estuary.

Vecinos, Colonos, y Finateros. In the Shadow of El Imposible. The farmers of the coastal uplands have quite a different situation from the fishers and woodcutters of the estuary There are three distinct subgroups of independent farmers in this area: the ordinary vecinos who have been living in the area for several generations; the colonos who are living, illegally, in the El Imposible Park, and the finateros All three of these groups crop individual farms. The average family appears to own about a manzana of land on which they crop corn, beans, and sorghum for home consumption. To make ends meet, many families rent extra land. This has now become more difficult, since landlords are reluctant to rent land because that was the basis on which many of them lost their land to finateros Receipts for rent are no longer given and a paradoxical situation has arisen in which the landowner, instead of welcoming improvement to land by tenants, now forbids them. For example, FUCRIDES, a Catholic rural development organization active in the demostration area, has been financing a production credit program This program requires farmers to practice soil and water conservation on the plots for which credit has been given. Many farmers have rented these plots and are thus faced with a dilemma when the owners forbid conservation techniques out of fear that they may represent a prelude to expropriation

Farmers in the demonstration area claim that for their traditional milpa plots they lack cash for the commercial fertilizer, herbicide, and insecticide that are now part of the annual cropping cycle. Many families crop less land than is required for their year's food supply, because they lack the capital to purchase these inputs Local farmers who lack capital for traditional land use will be unlikely to underwrite the added expenses of new, more productive land use behaviors promoted by a project.

Land Reform Cooperatives. The most unusual feature of the social landscape is the land reform cooperative. These large farms were expropriated in 1981 and

vested to cooperative of the former farm workers with a mortgage to ISTA, the land reform agency The membership is not related to the ability of the collectively held land to support the member's families Land is held in common but the right of inheritance is not clear. Members of the cooperative are paid a wage for their work but some cooperatives do not have enough work to employ their members full time The members then accept day labor elsewhere or rent land of their own outside the cooperative Profits to the cooperative are not divided and paid to members as dividends The management is elected by the members and directs production and marketing of surgarcane, beef, corn, and export crops such as melon and sesame Each member gets automatic access to at least one manzana of land on which to grow domestic food crops Cooperative members also rent additional Agrarian Reform Cooperatives in the Demostration Area Members have access to the water, wood, and pastures found on the cooperatives land.

Refugees from Eastern El Salvador. The social group about whom least is known is the refugee population from the eastern departments who fled the war They live in fairly large numbers near Cara Sucia and Barra de Santiago, but not in the unpland communities. Next to nothing at this point is known about their numbers, economic life (except that they heavily exploit mangroves and estuaries), or their eventual migratory intentions. A substantial part of the population of the coastal and lower piedmont area are recent immigrants. Project activities could attract new immigrants or induce those already here not to return to their home communities. Such an outcome might increase local pressure on the environment

El Salvador. Environmental Protection Project
Land Reform Cooperatives in the Demonstraiton Area

ECOOPERATIVE	MUNICIPALITY	TOWNSHIP	HECTARES	MEMBERS
Nueva York	San Francisco Menémdez	Cara Sucia	221	32
Cara Sucia	San Francisco Menendez	Cara Sucia	1,755	560
Nueva Guayapa	Jujutla	Guayapa	420	231
Santa Teresa	San Francisco Menéndez			
Los Monjes	San Francisco Menendez			

Source: ISTA, 1992

The Demonstration of Benefits Component
Possible Technical Innovations

Income Generating Tree Planting Tree planting is best presented to a population for economic rather than purely ecological purposes. Almost all wood for sale in the demonstration area is sold as firewood, although the market for fuelwood is not as robust as in other countries which have a heavy charcoal market. Fuelwood is cut almost everywhere in the demonstration area -- in the mangroves of Barra de Santiago, in the woodlots near El Imposible, and reportedly in the park itself The most spontaneously expressed interest in tree planting came from members of cooperatives that have large, collectively controlled areas of non-arable land that could be placed in trees Teak was the most familiar species as a domesticated woodcrop

Mangrove Reforestation. Some mangrove reforestation efforts were undertaken in the wake of the 1982 hurricane that destroyed a substantial portion of the Barra de Santiago mangrove forests Because it takes place on public land in the forest preserve, such efforts are not seen as benefitting any particular group, and local people will do this only for daily wages The planting undertaken by a national-level NGO, AMAR, used volunteers from San Salvador, plus local schoolchildren organized for the purpose

Soil and Water Conservation There are indications in the Rio Canas watershed of La Paz department that soil conservation projects can work when project managers recognize that activities such as digging canals entails considerable extra labor, either by the farmer and his family or by hired laborers The Rio Canas activity, funded by CATIE, gives free agricultural inputs to match the landowner's labor inputs. Even with free inputs, people with less than a manzana of land were reluctant to relinquish any space on their subsistence plots for canals or vegetative barriers.

The unit of project action should be the farm family or the farmer group as an land-using unit rather than the watershed as a physical unit It would be more realistic to introduce new models of land use that may eventually spread to other communities, recognizing that coverage at first will be spotty. At the same time, incentives can be built into activities on plots abutting watercourses For example, wages can be paid for the construction of mechanical ravine plugs on plots in high-priority areas Owner refusal is unlikely if the incentives are attractive enough, but complete coverage is not possible without incentives

There is a tendency among the residents of the demostration area to view donor projects first and foremost as a source of wage labor. However, certain clearly defined, labor intensive project-related tasks might be appropriately done under a straightforward wage labor arrangement AMAR, for example, has not been able to get the people of La Barra de Santiago to donate labor for mangrove reforestation, since nobody owns, and anybody can in fact subsequently harvest, the mangroves AMAR had to import volunteer labor from San Salvador Project personnel should pragmatically consider wage or quasi-wage disbursal for certain types of clearly defined tasks, generally on public property.

Buffer Zone Creation Vegetative buffer zones are desirable around both the mangrove forests and the El Imposible park. Project activities would best achieve their buffering objectives by installing a cordon of farmers applying

an agroforestry land use system (combining tree planting, subsistence cropping, and intensified commercial cropping) in exchange for their cooperation in forest protection. Project personnel should consider the possibility of wage labor arrangements for certain types of estuary and mangrove activities Wages were paid in the early 1980s for post-hurricane floral and faunal repopulation, to the satisfaction of the population and the benefit of the species repopulated Even a partial shift into farming by the estuary population would alleviate pressure on the estuaries The estuary population has virtually no access to crop land, nor to the capital needed to work such land even if it were available

Intensification and Commercialization of Farming. A major task of any NRM project is to assist farmers to move toward more intensive, commercial farming The income derived from such farming reduces the need for extractive use of the natural resources which the Project desires to protect In the mountain communities, the dilemma is not landlessness but land and capital shortage. Even if a family has access to land, it may not automatically participate in project-recommended erosion control measures New land use behaviors entail costs and risks Even apparently low-cost erosion-control interventions such as absorption trenches, diversion canals, vegetative strips were perceived as overly risky by farmers with less than a manzana of land on which to grow their year's food supply In other countries, this dilemma has been creatively addressed by an upland buffer zone strategy that entailed low-cost gravity-driven pipe sprinkler irrigation that was installed on condition that the benefitted larger landowners cede temporary rent-free usufruct rights on small plots to neighbors with less land

Project assistance to hillside farmers to begin land use that is more sustainable and more productive presupposes access to outside markets. There are six north-south feeder roads leading from the coast highway to communities beneath El Imposible Park. The roads do not permit easy marketing of crops, and could be upgraded with low cost and local labor.

Woman-Owned Microenterprises. The women in the Barra de Santiago are the major marketers of the fish caught in the area They are also major actors in the cutting and marketing of wood They differ occupationally in this sense from the women of the uplands, who have traditionally confined their energies to the home A buffer zone strategy which provides men with access to milpa land could theoretically shift women into the domestic role found in upland farming communities THis change for women in not likely, because they are used to being major earners and controllers of cash To mitigate potential negative socioeconomic impacts on women due to farming incentives offered to men, the Project should promote access to microenterprises.

Incentives and Benefits. No matter how technically appropriate the menu of technological choices, it will not evoke local interest if the technologies do not result in some kind of profit or production increment for the people who adopt them. The dilemma is clear in the case, for example, of mangrove reforestation There is no clear way of establishing individualized tenure over trees planted in mangrove swamps People therefore refuse to do this unless it is as wage labor. In general, there are four incentives that can motivate participation in the Project In order of probable farmer preference they are: (1) creative land-access arrangements, (2) wages, (3) access to credit, and (4) matches of inputs or other exchanges in return for participant labor.

Potential Project Spread Effect

In the policy and environmental education components, the Project has the potential for nationwide impact and coverage Ultimately, the spread effect of policy changes is largely contingent upon adherence to and enforcement of the policies by the national and municipal governments To the degree that there are gaps in the adherence to policy, the spread effect of even the most meticulously written policy will be low The criteria for evaluating the Project policy impacts will therefore not be restricted to enumeration of the decrees or laws passed The policy component will measure its impact in actual implementation, tested and refined primarily in the demonstration area The policy and demonstration two components are in fact symbiotic, in that certain technical innovations cannot occur without favorable policy changes Conversely, the policy reform cannot be judged effective unless successful adoption of the sustainable natural resource management occurs

Similar caveats obtain for environmental education. To the degree that this component focuses on the formal educational system, the low national rate of school attendance and the high dropout rates will limit the number of children actually exposed to the educational messages, even if environmental education curricula are successfully introduced into all the schools. It must be complemented by informal programs to reach adults, as well as awareness campaigns which promote the need for everyone to cooperate in sustainable natural resource use. An example is the series of NGO advertisements urging people not to eat turtle eggs Salvadoran mangrove forests, estuaries, and hillsides will benefit little from new attitudes unless these are translated into behavior. Activity in the demonstration area permits measurement of the effectiveness of the environmental education component

POSSIBLE IMPEDIMENTS

Religious Factionalism. Conventional analysis often alludes to the highly Catholic character of El Salvador as versus the spread of evangelical Protestantism Though there is little statistical data on the matter, the image of religious homogeneity is no longer valid. Evangelical churches have proliferated in the demonstration, and both the urban and rural landscape is dotted with a variety of Protestant churches. On the Ahuachapio road to the El Imposible watershed, for example, the caserio of El Refugio is predominantly Protestant The presumably Catholic village of San Miguelito, locus of a Catholic Church and of a project by FUCRIDES linked to the Archdiocese of San Salvador, may already be 40% Protestant

This has implications for the organization of outreach activities in upland communities In the itinerant and rough-and-tumble Barra de Santiago area, people seem less concerned about religious affiliation In the traditional and residentially stable upland communities, religion is taken seriously In San Miguelito, far up the watershed bordering El Imposible, during a religious campaign throughout the night loudspeakers called sinners (apparently Catholic in their majority) to repentance. People in the uplands appear to take religion very seriously For example, in Cara Sucia, at least some Protestants withdraw from communal activities, in effect breaking many of their pre-conversion social ties On the other hand, the president of a newly formed health committee in the Protestant caserio of El Refugio was an evangelical, indicating that Protestants might be willing to participate in at least some activities led by an evangelical.

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In any case, in the uplands people seem to identify much more strongly with their religious group than with the community and it is not clear that Catholics and evangelicals will work together easily. Project activities will almost certainly deal with groups rather than individual households, but it should not be assumed that the caserio will be the unit of project organization This might entail an unrealistic attempt to breach sectarian lines.

The Culture of Violence The violence that has traditionally characterized El Salvador has intensified with the war The demonstration area was spared major military confrontations, but it manifests another facet of violence With the cessation of hostilities, a large number of armed, unemployed ex-combatents is now wandering the area, instilling an atmosphere of terror The terror increases to the degree that communities lose their contingents of police and soldiers. The result has been a series of killings and robberies over which the populaiton has little control. Although the situation will improve with the deployment of the National Civilian Police, the ambience of violence could restrict the unfolding of project activities.

Causes of Poverty In any industrial society, opinions differ among different groups of intellectuals and politicians as to the causes and solutions of social problems. In El Salvador, however, these discrepancies are extreme. On the right, for example, a 1987 report of the San Salvador Chamber of Commerce defined the essence of the Salvadoran crisis as one of "macroeconomic imbalance" due, externally, to fluctuations in the international price of coffee and other key Salvadoran exports, and internally, to a destructive war. This analysis defines the war itself as the cause, and makes no mention of the pre-existing economic inequalities that contributed to the war In addition, the report alleges that GOES economic policymakers foster inappropriate macroeconomic policies. In this type of analysis, El Salvador's problems are attributed to the behavior of rural guerrillas on the one hand, and of urban bureaucrats who block the large business on the other The attitudes embodied in the analysis remain true for the more conservative parts of the political spectrum.

Salvadoran intellectuals of the left are equally ideological but less econometrically sophisticated A case in point is an analysis authored in the name of the Communist Parties of El Salvador and Honduras. This impassioned 250-page book finds the causes of El Salvador's problems in the machinations of imperialism, the Pentagon, the State Department, and their collaborating fascist Salvadoran oligarchy. It concludes with a plea for the cause of our people. In the emerging pluralism which is occuring after the peace accords, this message is no longer confined to veiled groups, but can now be openly presented in the marketplace for ideas

Politicization of Technical Questions Ideological factionalism is not restricted to the intelligentsia. Field interviews with or about cooperatives attempted to learn whether members genuinely preferred a collective mode of production or private parcelization of the land. This debate has been active since 1988, when the idea of freehold land ownership was openly supported

Cooperative members and their directorates ponder the issue in straightforward economic terms. Many members would prefer parcelization; most directorates prefer the current arrangement. When the matter is discussed with urban Salvadorans or NGO representatives, i e with people not participating in, but

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merely observing, cooperatives, it is clear that one's position on the issue is interpreted as a sign of one's political allegiance. A preference for parcelization appeared to be a vote for ARENA, whereas a preference for collectivized production seemed to label a person as a sympathizer of the Frente A personal position on the matter is unlikely to be evaluated on its intellectual merits Rather, it may evoke the implicit reaction that, "Ah, you must be one of them". The politically charged atmosphere often makes interlocutors on a technical issue treat each other not as participants in an analytic, problem-solving dialogue, but as adherents of different political points of view

Ideological antagonisms continue at such intensity that one side may be reluctant to collaborate if the Project is simultaneously assisting the others Project staff should be prepared to find themselves shuttling between hostile factions inhabiting fundamentally different intellectual and ideological planets Pro-government groups will be much more eager to work with the Project in the beginning, though eventually collaborators at most points in the political spectrum will emerge if it becomes clear that the Projects is achieving bona fide benefits for small farmer life

It is critical that project staff energetically pursue contacts with organizations of a broad variety of persuasions. The best course, at least in the beginning, is to work separately with different groups, and to avoid unnecessary attempts to oblige hostile Salvadoran groups to dialogue or network with each other as a condition of their participation.

The Myth of the Ignorant Peasant

Many urban, educated Salvadorans of different political persuasions hold four positions, both explicitly, with considerable consensus

- The rural masses are not only uneducated in a formal scholastic sense, but ig ignorant and backwards in a functional sense as well
- Many ecologically maladaptive behaviors result from "peasant" laziness Farmers burn their fields so they won't have to clear them, they apply pesticide to save themselves time weeding.
- Development resources are best channeled to villagers in the form of education Wages or cash credit would merely be misspent on alcohol or other vices. Peasants are not only lazy, many are also drunkards.
- The prime challenge of environmental projects is to raise the consciousness of these rural masses concerning NRM and related issues

These four propositions appear to be uniformly wrong The rural masses may be unschooled and illiterate, but they are hardly ignorant, either about environment or their economy For adult villagers, the main need is not education but access to new technologies and the resources required to implement them. Information, i e education, about how to use both is necessary, but detached from the means to enable or motivate them to modify their behavior, a program to teach farmers about the environment is about as useful as a rural calculator project that gives farmers the manuals but not the calculators themselves

Certainly there is a need for "consciousness raising". But that component of the Project should also be directed to the educated urban environmentalist, to challenge the widespread assumptions about a benighted rural mass. Urban

environmentalists could profit from education generally in more sophisticated concepts of the linkages between environment and development, and the primary productive role of renewable natural resources (vs environment in general) in this linkage When these noblesse-oblige assumptions and conceptual confusions have been purged from NGO's, they be able to play a meaningful role in the protection and restoration of El Salvador's natural resources.

Another major constraint concerns the questionable operational status of many of the NGOs who will be competing for the Project resources USAID itself has had a powerful and indisputably evolutionary impact on the genesis, structure, and functioning of the NGO community in El Salvador In ecological terms, much of the local NGO community can be seen as an adaptive foraging response to the altered conditions of resource procurement in the donor community. To maintain strategic proximity to their resource base, these new groups are virtually all based in the capital city, and almost all are in need of the vehicles, office space, photocopiers, fax machines, and staff salaries on which the future development and well-being of the Salvadoran rural masses and their environment so heavily depends

The truly operational NGO will have activities going on in the field and will already have instituted arrangements for paying and transporting its core staff. The partner of preference with whom the Project should interact is the NGO which (1) requests an assistance for specific project-relevant activities, whether in the demonstration area or nationwide, (2) can specify costs and timelines for the requested activity, and (3) can adhere to a reasonable administrative cost for institutional support beyond the direct costs of activity execution.

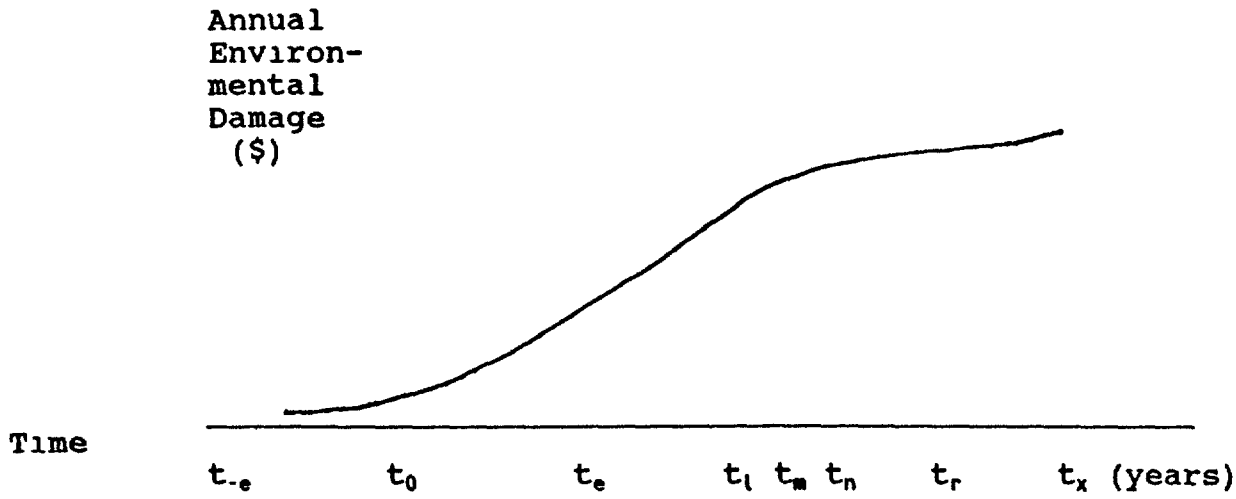
ANNEX F

PROMESA ECONOMIC ANALYSIS

1. Conceptual Problems

There are at least two major conceptual problems in applying conventional benefit/cost (B/C) or internal rate of return (IRR) analysis to environmental projects. The first concerns the choice of discount rate. This is really a problem with B/C and IRR analysis generally, but it has consequences for the analysis of environmental protection/preservation that go beyond those related to the economic viability of a capital investment project. Especially if the discount rate is thought of as the opportunity cost of capital (but also if it is perceived as a reflection of social time preference), even a "market-determined" interest (discount) rate in the typical developing country reflects imperfect markets and thus is higher than the rate would be in a perfectly competitive economy. This is not an insuperable problem if one is ranking alternative capital investment projects and comparing them with the (imperfect-market) opportunity cost of capital. But if one is computing the net present value (NPV) of environmental benefits or costs well into the future, those NPVs will become very small rather quickly if the discount rate is high: the NPV of $100.00 fifteen years into the future, discounted at 10%, is only $23.90. If the perfectly-competitive discount rate were actually 6%, then the NPV of $100.00 worth of environmental benefits (e.g., from preservation of biological diversity) or costs (in the sense, e.g , of declining crop yields resulting from failure to protect the environment) fifteen years from now would be a much higher $47.10. The environment is held hostage, therefore, to market imperfections.

The second problem with the discount rate has to do with the time path of the costs of environmental degradation. It is reasonable to assume that many such costs follow an S-curve pattern over time, as illustrated in the diagram below, where year 0 (t_0) represents the year before an ecological zone is "invaded" by human exploitation:



The NPV of the environmental costs of exploiting such an ecological zone is sensitive to where on the S-curve one begins the analysis. If one wishes to protect a presently-unexploited forest from future exploitation, one could start the analysis in year 0 (assuming exploitation is expected the following year in the absence of protective measures) or even in year t_{-e} (if imminent exploitation is not anticipated). Whatever discount rate is used, the NPV of the environmental damage in the initial years (e.g. t_0 through t_e) is relatively small simply because environmental damage is small. The heavy damage in future years, meanwhile, has a relatively low NPV because of the cumulative effects of discounting over longer periods of time.

If, on the other hand, one starts the analysis at year t_m, <u>and measures damage in the first year as the change between t_0 and t_m</u>, rather than the change from the immediately preceding year (t_l), the NPV of the damage between t_m and, say, t_x will exceed that between t_0 and t_r. Thus other things being equal, it makes less "economic" sense, in the traditional manner of speaking, to have the foresight to prevent a process of environmental deterioration from getting started than to stop it once it is under way. This is counter-intuitive.[1]

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[1] On the other hand, the costs of undoing damage once the process of deterioration is under way tend to be higher than the costs of prevention, and therefore undoing the damage may appear unattractive even if one casts a wide net to find the direct and indirect benefits of doing so. The point remains, however, that traditional analysis of a protected-area project (i.e. one that starts in year 0 or earlier) will understate the amount of environmental damage that would occur in the absence of protective measures.

2. Measurement Problems

The benefits of environmental protection projects are difficult to measure because they are both direct and indirect as well as widely diffused within the economy. Even identifying all the various types of benefits—let alone quantifying them—is a difficult task.

The policy component of PROMESA anticipates changes in a large number of policies affecting the environment. These may include:

- improved land tenure security;
- reduction/elimination of subsidies on stumpage fees;
- the lifting of restrictions on forestry activities in areas where sustainable forestry is feasible;
- changes in land classification to encourage better land use;
- establishment of forestry and fisheries management standards;
- reduction/elimination of subsidies on water, diesel fuel, and electricity;
- regulatory measures and/or incentives to reduce industrial and automobile exhaust pollution; and
- the imposition of charges on shrimp producers harvesting post-larvae from mangrove estuaries.

Even though it is possible to estimate the economic benefits of some of these reforms, their timing and extent cannot be predicted. Moreover, the influence of PROMESA cannot easily be isolated from other factors influencing such policy changes.

The expected educational benefits of PROMESA are likewise difficult to pin down. Certain types of programs aimed at adults can be expected to produce benefits within a relatively short period of time, and in some cases—e.g., training farmers to use pesticides more efficiently and safely or to rely instead on biological controls—the benefits are relatively easy to identify and are traceable to specific educational activities. But the benefits of other types of environmental education are diffuse, indirect, and of uncertain magnitude and timing. Moreover, in the case of primary education most benefits will be long-term. The effectiveness of educational and training programs will depend on how widespread and multifaceted these programs are, for the whole can be greater than the sum of the parts through mutual reinforcement of environmental messages. But without better economic incentives and other policy actions, there are limits to the ability of environmental education to affect behavior. If, on the other hand, a major educational effort is combined with appropriate policy changes, then one must face the difficult task of isolating the marginal contributions of educational and training programs to improvements in environmental indicators.

For the demonstration areas, a major obstacle to the calculation of economic costs and benefits is the lack of good baseline data. The collection of such data should be a high priority in the first such area to be supported by PROMESA, and project activity in that area should include at an early stage the calculation of IRR and B/C estimates as well as indicators of cost-effectiveness. A major difficulty in the calculation of such estimates is that project activity in the first demonstration area will include start-up costs and other overhead expenditures that should be spread out, at a minimum, over all of the demonstration areas to be financed by PROMESA. To the extent that PROMESA produces "demonstration effects" leading to the adoption of environmental protection and pollution-abating measures in non-project areas, the overhead expenditures should be spread out over an even larger geographic area, thus reducing unit costs by adding to project benefits at a relatively small incremental cost.

The benefits of environmental protection programs are multifaceted. One recent volume—which includes case studies of IRR and B/C analysis in developing countries—classifies the potential benefits into the following categories:[2]

1. Recreation/tourism;
2. Watershed values (erosion control, local flood control, influence on stream flows);
3. Ecological processes (fixing and cycling of nutrients, soil formation, circulating and cleaning of air and water, global life support);
4. Biodiversity (gene resources, species protection, ecosystem diversity, evolutionary processes);
5. Education and research;
6. Consumptive benefits (timber, wildlife products, non-timber forest products);
7. Nonconsumptive benefits (aesthetic, spiritual, cultural/historical, existence value); and
8. Future values (option values, quasi-option values).

This list is not exhaustive—health benefits are one notable omission—but it is an advance over earlier compendia of environmental benefits that were less comprehensive and thus often appeared to make investments in environmental preservation of questionable economic justification. While measurement problems for some of the benefits identified above have not yet been resolved satisfactorily, interesting and usable approaches to measuring other benefits on this list have been devised. But

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[2] John A. Dixon and Paul B. Sherman, Economics of Protected Areas: A New Look at Benefits and Costs (Covelo, CA: Island Press, 1990). For a shorter presentation, see the authors' article, "Economics of Protected Areas," Ambio 20, No. 2 (April 1991):68-74.

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the data needed to make such measurements are not available in El Salvador at this time.

On the cost side, it is important to consider both direct and indirect costs as well as opportunity costs. It is particularly difficult to identify the latter in advance, since implementation of the demonstration area activities will be based upon information obtained in discussions with local residents, who are likely to be more knowledgeable about opportunity costs than outside advisors.

3. Methodology Selected

Taking into account the conceptual and measurement problems described above, the principal methodology selected for the PROMESA economic analysis is what might be termed "reverse IRR" analysis. Instead of starting with quantified benefits and costs and then computing the IRR (and/or B/C ratio), we start with a given IRR as well as the estimated annual stream of costs taken from the project paper and supporting documents. The required benefit stream is then calculated as a residual on the assumption that benefits gradually rise from year 1 through 7 (or later for some project components, because of delayed benefits) and then are sustained at that level through year 20, considered to be the terminal year of the project for purposes of the analysis.

Benefit streams will be generated for two alternative IRRs: (a) 10%, the normal discount rate applied to capital projects in El Salvador, and (b) 6%, an "environmentally friendly" rate that seeks to compensate for the conceptual shortcomings of traditional IRR and B/C analysis when applied to environmental protection activities, as discussed in the first section of this Annex.[3] Judgment must then be passed on whether the benefit

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[3] There is a great deal of controversy in the literature about whether a "special" discount rate should be applied to environmental protection projects. At the extreme, some environmentalists argue that the discount rate should be zero, a position we believe is inconsistent with economic principles. But those who advocate sticking with the "standard" discount rate in a particular country and then qualifying/adjusting the results have a difficult time explaining why this form of tinkering is necessarily better than tinkering with the discount rate. For useful discussions of the issues, by authors who oppose a special discount rate, see David W. Pearce and R. Kerry Turner, Economics of Natural Resources and the Environment (Baltimore: The Johns Hopkins University Press, 1990), Ch. 14; and J.T. Winpenny, Values for the Environment: A Guide to Economic Appraisal (London: HMSO for the Overseas Development Institute, 1991), pp. 64-68. A good statement of the case for a special discount rate is made in Norman Myers, "Discounting and Depletion: The Case of Tropical Forests,"

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streams generated by the analysis are plausible. If the benefit streams required to justify the activity appear to be implausibly high, but the activities still seem worthwhile on the basis of experience elsewhere, this is an indication that a project redesign is needed to reduce costs and/or expand benefits. Even if the benefit streams do appear plausible, normal project monitoring should include a continual examination of financial and economic data to look for ways of lowering costs and increasing benefits.[4]

Two other comments on the methodology are in order:

- The costs of contract management and administration, and of USAID-funded overall project support/evaluations/audits, are pro-rated to each of the three project components in proportion to their relative costs. The pro-rating is done annually, with separate calculations for dollar and local-currency expenditures. Separate analyses are conducted for each of the three project components.
- The 5% annual rate of inflation built into the project's financial tables is factored out, so that the economic analysis is carried out on the basis of constant 1993 prices.

The methodology described above will be supplemented with estimated unit costs for project outputs where such calculations are feasible at this time. In addition, we will discuss the results of IRR analyses of (a) a mangrove management project proposed for the Barra de Santiago area (which lies within the boundaries of PROMESA's first demonstration area), and (b) other producer-level environmental protection activities proposed for adoption by El Salvador's farmers.

4. Results of the Analysis

For the policy component, 10% of the ultimate project benefits are estimated to occur in 1993. This percentage gradually rises until the year 2000, when the full impact of the reforms stimulated under this component is assumed to be achieved. It is further assumed that no recurrent costs are necessary to prevent erosion of the effects of these reforms, or backsliding in their implementation. Total project costs with at a discount rate (IRR) of 10% have a net present value (NPV)of $7,403,583, and the required stream of sustained annual project benefits from 2000 through 2012 is $1,119,789. At a discount rate of 6%, the NPV of total costs rises to $8,198,654; but the sustainable annual benefit figure is down to $887,331, or about 21% lower than in the case of the standard discount rate.

Futures (December 1977):502-509.

[4] As explained below, the project design chosen is not necessarily the least-cost method, but it is judged to be the preferable alternative because it is perceived to be more efficient in delivering project benefits.

Table F-1 El Salvador Environmental Protection
Minimum Required Benefit for Policy Activities

Year	Total Costs	Total Costs 1993 Prices	Total Benefits (% of X)	Required Benefit
1993	196,731	196,731	0.10	93,793
1994	2,412,086	2,297,225	0.25	234,482
1995	1,700,408	1,542,320	0.38	356,413
1996	1,408,763	1,216,942	0.50	468,964
1997	1,321,028	1,086,813	0.58	543,999
1998	1,350,249	1,057,955	0.65	609,654
1999	464,616	346,704	0.71	665,929
2000	181,165	128,751	0.74	694,067
2001	190,223	128,751	0.77	722,205
2002	199,734	128,751	0.80	750,343
2003	209,721	128,751	0.83	778,481
2004	220,207	128,751	0.85	797,239
2005	231,217	128,751	0.87	815,998
2006	242,778	128,751	0.89	834,756
2007	254,917	128,751	0.91	853,515
2008	267,663	128,751	0.93	872,274
2009	281,046	128,751	0.95	891,032
2010	295,099	128,751	0.97	909,791
2011	309,853	128,751	0.99	928,549
2012	325,346	128,751	1.00	937,928
NPV 6%		7,035,560		937,928
NPV 10%		5,986,577		1,165,291

Table F-2 El Salvador. Environmental Protection
Cost Elements for Policy Activities

Year	Component Cost	JCC Advisor	Priority Studies	Project Mgmt (29 6%)	AID Project Costs	SEMA	FOCAM 33%	Counterpart Costs
1993	0	52,800	55,247	40,684	148,731	48,000	0	48,000
1994	1,662,372	166,320	190,000	150,134	2,168,826	143,360	99,900	243,260
1995	1,008,573	174,636	0	138,772	1,321,981	178,627	199,800	378,427
1996	807,414	152,807	0	85,770	1,045,991	162,972	199,800	362,772
1997	639,874	0	0	90,902	730,776	157,352	432,900	590,252
1998	633,983	0	0	131,634	765,617	151,732	432,900	584,632
1999	247,784	0	0	44,294	292,078	39,338	133,200	172,538
2000	0	0	0	0	0	0	0	181,165
2001	0	0	0	0	0	0	0	190,223
2002	0	0	0	0	0	0	0	199,734
2003	0	0	0	0	0	0	0	209,721
2004	0	0	0	0	0	0	0	220,207
2005	0	0	0	0	0	0	0	231,217
2006	0	0	0	0	0	0	0	242,778
2007	0	0	0	0	0	0	0	254,917
2008	0	0	0	0	0	0	0	267,663
2009	0	0	0	0	0	0	0	281,046
2010	0	0	0	0	0	0	0	295,099
2011	0	0	0	0	0	0	0	309,853
2012	0	0	0	0	0	0	0	325,346
	5,000,000	546,563	245,247	682,190	6,474,000	881,381	1,498,500	

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Given the potential for some policy changes to have significant environmental impacts at relatively low implementation costs (e.g. the removal of subsidies on water, electricity, and fuel), the required benefit stream needed to justify the expenditures under the policy component is well within reason. Indeed, some policy reforms can be expected to have much higher returns than 10%. Moreover, they are examples of what the World Bank calls "win-win" actions that not only help the environment but also promote economic growth and equity.[5]

There is no guarantee, of course, that the stream of benefits posited above will in fact materialize.[6] It is well known, for example, that there is strong resistance in El Salvador to raising electricity prices to the point that they fully cover costs. Changes in forestry and land-use policies will likewise be difficult to enact and implement. Nevertheless, the list of potential policy reforms presented earlier in this Annex provides an illustration of how wide is the range of policy areas affecting the environment. Successful implementation of even a relatively small proportion of potential policy reforms should be sufficient to produce the kind of benefit stream shown in Table 1. The education measures to be supported by PROMESA should increase policy-makers' understanding of the "win-win" nature of many policy reforms as well as help build a constituency for those reforms.

The <u>educational</u> benefit stream required to justify project expenditures is shown in Table 2. In this case we assume that some of the benefits are longer-term than those of the policy-reform component; this is especially true for primary education. Thus we show project benefits increasing well beyond the end-of-project date, levelling off at a sustainable level in 2006. No additional costs after 1999 are taken into account, although it is not unreasonable to assume that some of the benefits of environmental education and training, including education via exposure to media presentations, erodes over time without some follow-up measures. To the extent that such measures might be included as "replacement investment" costs, the required benefit stream would be greater than shown in Table 2.

At a 10% discount rate, the NPV of total project costs is $6,741,475, and the sustainable annual benefit requirement

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[5] See the World Bank's <u>World Development Report 1992</u>, which includes a detailed examination of the interrelationships between development and the environment.

[6] It is also possible that progress toward achieving the 100% level of policy reform impact will be slower than shown in Table 1. In this case the required sustainable benefit level would have to be adjusted upward.

Table F-3 El Salvador. Environmental Protection
Minimum Required Benefit for Environmental
Education Activities

Year	Total Costs	Total Costs 1993 Prices	Total Benefits (% of X)	Required Benefit 6%	Required Benefit 10%
1993	34,499	34,499	0 10	59,534	77,713
1994	2,187,236	2,083,082	0 25	148,836	194,282
1995	1,868,401	1,694,695	0 38	226,230	295,308
1996	788,790	681,386	0 50	297,671	388,564
1997	479,682	394,636	0 58	345,299	450,734
1998	469,010	367,482	0 65	386,973	505,133
1999	126,360	94,292	0 71	422,693	551,760
2000	0	0	0 74	440,554	575,074
2001	0	0	0 77	458,414	598,388
2002	0	0	0 80	476,274	621,702
2003	0	0	0 83	494,134	645,016
2004	0	0	0 85	506,041	660,558
2005	0	0	0 87	517,948	676,101
2006	0	0	0 89	529,855	691,643
2007	0	0	0 91	541,762	707,186
2008	0	0	0 93	553,669	722,728
2009	0	0	0 95	565,576	738,271
2010	0	0	0 97	577,482	753,813
2011	0	0	0 99	589,389	769,356
2012	0	0	1 00	595,343	777,127
	5,953,978				
NPV 6%				595,343	
NPV 10%					777,127

Table F-4 El Salvador. Environmental Protection
Cost Elements for Environmental Education Activities

Year	Component	Management	AID Project Costs	MOE	FOCAM	Counterpart Costs	Total Costs
	25.1%				22.2%		
1993	0	34,499	34,499	0	0	0	34,499
1994	1,979,886	127,310	2,107,196	13,440	66,600	80,040	2,187,236
1995	1,602,473	117,675	1,720,148	15,053	133,200	148,253	1,868,401
1996	566,000	72,731	638,731	16,859	133,200	150,059	788,790
1997	75,000	77,082	152,082	39,000	288,600	327,600	479,682
1998	26,640	111,622	138,262	42,148	288,600	330,748	469,010
1999	0	37,560	37,560	0	88,800	88,800	126,360
2000			0			0	0
2001			0			0	0
2002			0			0	0
2003			0			0	0
2004			0			0	0
2005			0			0	0
2006			0			0	0
2007			0			0	0
2008			0			0	0
2009			0			0	0
2010			0			0	0
2011			0			0	0
2012			0			0	0
	4,250,000	578,478	4,828,478	126,500	999,000	1,125,500	5,953,978

beginning in 2006 is $1,233,988. If a 6% discount rate is used, the NPV to total costs rises to $7,448,837, but the sustainable annual benefit falls by 23% to $949,719. Perhaps the best way to illustrate what this means is to say that by the year 2006, one in every six to eight Salvadorans would each have to be providing a sustained annual level of benefits to the environment of $1.00 (in 1993 prices), over and above those educational and training benefits which might be considered as contributing to policy reforms. This is surely a modest, reasonable target level of benefits.

A number of difficulties arise in calculating a required benefit stream for the demonstration areas. If one limits the analysis to the three project sites, required benefits (and costs per hectare) are overstated because costs are in fact intended to be spread out over a larger number of hectares as a result of lessons learned in the demonstration areas. But if one keeps spinning off both additional costs and additional benefits over an entire 20-year period, other distortions arise because most of the benefits incurred in the latter part of this long time frame will not be realized until after year 20 (although they will be heavily discounted). Moreover, opportunity costs (see below) rise rapidly if new land benefiting from environmental protection measures is attributed indirectly to the project.

Our solution to this problem is to include in the benefit stream both the land in the three demonstration areas (14,300 hectares) and land affected indirectly by the project, up to and including land for which environmental protection measures are initiated as late as 1999 (24,300 hectares). However, we assume that the degree of environmental protection achieved (benefits generated) on the latter is only half that achieved in the demonstration areas, where extension agents, NGOs, and others will work more intensively with project beneficiaries. In the three demonstration areas, intensive work with farmers and other beneficiaries will be carried out over a two-year period, although the full benefits of these efforts will not be achieved until the third year; 40% are assumed to be achieved in the first year, and a cumulative 80% by the second year.

Farmers will incur opportunity costs because they will be taking approximately one-sixth of their land out of crop production. Opportunity costs are defined as net income foregone, estimated to average about $225 in 1993 and then to begin declining in 1997, reaching only about $100 in 2012.

Table 3 shows that the NPV for total costs of the demonstration area component of PROMESA is $15,704,713 at a 10% discount rate, and the required sustained annual benefit stream at the 100%-level (beginning in 2001) is $3,104,535. At a 6% discount rate the NPV of total costs is $18,359,551, and the sustained annual benefit stream is $2,448,386, about 21% below

Table F-5 El Salvador Environmental Protection
Minimum Required Benefit for Demonstration Activities

Year	Total Costs	Total Costs 1993 Prices	Total Benefits (% of X)	Required Benefit 6%	Required Benefit 10%
1993	82,063	82,063	0 002	6,398	7,854
1994	2,550,824	2,429,356	0 014	44,783	54,978
1995	2,884,649	2,616,462	0 045	143,946	176,715
1996	2,324,340	2,007,852	0 097	310,283	380,918
1997	2,519,628	2,072,904	0 178	569,386	699,005
1998	2,377,473	1,862,812	0 270	863,675	1,060,288
1999	1,211,721	904,205	0 349	1,116,380	1,370,521
2000	995,175	707,252	0 413	1,321,103	1,621,848
2001	1,174,050	794,643	0 466	1,490,639	1,829,979
2002	1,325,925	854,703	0 520	1,663,374	2,042,036
2003	1,477,800	907,241	0 573	1,832,910	2,250,167
2004	1,629,675	952,837	0 626	2,002,446	2,458,298
2005	1,781,550	992,034	0 680	2,175,181	2,670,355
2006	1,933,425	1,025,337	0 733	2,344,717	2,878,486
2007	2,085,300	1,053,218	0 786	2,514,253	3,086,617
2008	2,237,175	1,076,119	0 840	2,686,988	3,298,674
2009	2,389,050	1,094,451	0 893	2,856,525	3,506,805
2010	2,540,925	1,108,597	0 947	3,029,260	3,718,863
2011	2,692,800	1,118,914	1 000	3,198,796	3,926,993
2012	2,844,675	1,125,734	1 000	3,198,796	3,926,993
		15,130,478		3,198,796	
		11,650,081			3,926,993

Table F-6 El Salvador Environmental Protection
Cost Cost Elements for Demonstration Activities

Year	Component	45.3% Management	AID Project Costs	ECC	FOCAM	NGOs	Counterpart Costs	Beneficiary Opportunity Costs
1993	0	62,263	62,263	19,800	0	0	19,800	0
1994	2,040,587	229,766	2,270,353	140,896	133,500	0	274,396	6,075
1995	2,102,698	212,377	2,315,075	188,160	267,000	75,264	530,424	39,150
1996	1,455,811	131,263	1,587,074	173,650	267,000	168,591	609,241	128,025
1997	1,167,579	139,116	1,306,695	169,311	578,500	188,822	936,633	276,300
1998	721,914	201,453	923,367	162,410	578,500	207,396	948,306	505,800
1999	161,412	67,788	229,200	36,821	178,000	0	214,821	767,700
2000			0				0	995,175
2001			0				0	1,174,050
2002			0				0	1,325,925
2003			0				0	1,477,800
2004			0				0	1,629,675
2005			0				0	1,781,550
2006			0				0	1,933,425
2007			0				0	2,085,300
2008			0				0	2,237,175
2009			0				0	2,389,050
2010			0				0	2,540,925
2011			0				0	2,692,800
2012	7,650,000	1,650,000	8,694,000	891,138	2,001,500	640,073	2,641,573	2,844,675

the required benefits at a 10% discount rate. The required sustained annual benefit stream is $117 on a per-hectare basis at 10% and $93 at 6% (after dividing by two the number of hectares on which indirect project activity is assumed to yield only half the benefits in the demonstration areas). This may be an ambitious target, and ways to reduce costs will need to be examined.

5. Supplementary Analysis

a. Unit-Cost Estimates

Project activity in the demonstration areas will affect an estimated total of 14,300 hectares, of which 11,300 will be in areas where sustainable agro-forestry and soil conservation activities are to be implemented and 3,000 will be in buffer zones. If per-hectare costs for the demonstration area component are calculated for these 14,300 hectares only, they amount to $1,098 (NPV) at a 10% discount rate and $1,284 at 6%. For two reasons, however, these figures should be regarded as unrealistically high upper limits for the types of environmental measures being supported. First, the lessons learned from implementing project activities in the demonstration areas should result in lower unit costs for subsequent activities of a similar nature. Second, to the extent that successful technologies developed by project activities spill over into non-project areas, project costs will be spread over a larger number of hectares. If we include half the hectares in the non-project areas indirectly benefiting from the project (because benefits are assumed to be 50% lower), then the per-hectare values for the NPVs are $594 and $694, respectively. These still seem rather high, and likewise argue for a closer look at costs for this component of PROMESA.

b. Results of Related Studies

A project paper prepared by CATIE and UICN for a proposed mangrove management project in the Barra de Santiago area includes economic analyses for sustained forestry and fishing activities by groups of small producers.[7] At the level of these groups, investment in sustainable production technologies was calculated to have the following B/C ratios and IRRs:

	Forestry	Fishing
B/C Ratio	1.86	1.31
IRR	28.16	33.46

[7] CATIE/UICN, Programa Manejo Integrado de Recursos Naturales, Proyecto Conservación para el Desarrollo Sostenible en Centroamérica, Propuesta de manejo de los recursos asociados a los manglares de la Barra de Santiago (Turrialba, Costa Rica: CATIE, 1991).

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For the forestry activities, net incremental annual income for each of the families targeted by the project was calculated to reach approximately $1,680 by year 7 and to be sustained at that level for the balance of the 20-year period used for the analysis. (Replacement investment, e.g. for a truck and chain saws, would have to financed, however, out of that net income stream.)

While this analysis shows that the adoption of sustainable forestry and fishing practices is economically justified for the families involved, it does not take into account project-level costs deemed necessary to induce and facilitate investments in the new technologies. At the same time, the analysis does not consider economy-wide benefits resulting from project activity (or, for that matter, non-cash benefits, such as improved health or aesthetic and cultural benefits that would accrue to the project participants). Thus it is not possible to come to any clear conclusion about the economic viability of the project as a whole.

Other studies of the viability of adopting sustainable forestry or agricultural practices in El Salvador have reported IRRs that often are even higher that those calculated in the CATIE-UICN study:

Activity	IRR (percent)
Woodlot, madrecacao	7.0[a]
Teak, pure stand	17.5[a]
Teak and basic grains	18.0[a]-43.0[b]
Eucalyptus, pure stand	55.0[a]-88.0[c]
Eucalyptus and basic grains	62.0[a]-120.0[b]-193.0[c]
Contour plowing and other conservation practices, basic grains	53.0[a]
Traditional practices, basic grains	negative
Fishscale terracing, bananas	88.0[a]

Sources:
a [add reference]
b [add reference]
c [add reference]

The same caveats, however, apply to these studies, which are based on farm-level analysis of the types of activities that

might be appropriate for the upland and coastal-plain areas of the PROMESA demonstration areas (but not the estuarine areas). The studies assume that necessary infrastructure and supporting services are in place. Project-level analysis would therefore tend to show lower IRRs.

The limited scope of the economic analyses carried out to date for sustainable agricultural practices in El Salvador illustrates how difficult it is to undertake a project-wide economic analysis that seeks to provide a full accounting of benefits and costs. Much of the data needed for such an analysis is not available. To remedy this problem, and to provide a better basis for selecting project activities after the initial years of the PROMESA project, a comprehensive economic analysis, including IRRs and B/C ratios, should be conducted for the activities to be carried out in PROMESA's first demonstration area.

6. Cost Effectiveness of Alternative Project Designs

Initially, the Mission thought that the most cost-effective way to meet the objectives of PROMESA would be to have a major international environmental organization(s) design and implement the project. Environmental PVOs generally have low overheads and no fees. Informal approaches to these groups, however, revealed that they had a number of objections to working in El Salvador: the civil war, winding down but still going on at the time; the relatively small geographic areas that could be targeted for protection; the size of the project, deemed too large for any one of them to execute alone; and the amount of the counterpart funds required ($6 million).

PROMESA was then offered to potential contractors under a Request for Application (RFA) soliciting PVOs and universities, or consortia thereof, to design the project under AID's collaborative mode: that is, the winner of the competition would be eligible to implement the project after presenting an acceptable design. Universities, like PVOs, generally have lower overhead rates than for-profit firms, and no fees. Four proposals were received, with the organization awarded the grant having an overhead rate of 24%.

Unfortunately, the design presented for the project in May 1992 was unsatisfactory in several respects. The international environmental organization associated with the lead PVO dropped out of the project, and the lead PVO, while having solid expertise in NGO strengthening, did not present a sufficiently strong design for other aspects of the project. The Mission therefore terminated the collaborative-mode arrangement at this stage.

Because of these difficulties, the PROMESA project will be offered through an RFP to the firm, or consortium of a for-profit firm(s) and a major international environmental PVO(s), providing

the best proposal for carrying out the project's objectives. Because for-profit firms charge up to 100% overhead on direct costs, plus a fee, the overall cost of the project will be higher than originally contemplated, although overhead is likely to be held down somewhat if a major international environmental PVO were paired with a for-profit firm. In spite of the higher cost, this contracting strategy is recommended as the best alternative for accomplishing the project's objectives. Given the managerial and administrative advantages a for-profit firm can offer, project implementation is likely to proceed more smoothly than under a project led by a PVO lacking the experience and resources effectively to manage an undertaking of this magnitude. In other words, the project will be costlier, but more will be accomplished.

7. Other Issues

A key issue not directly addressed in the economic analysis concerns the emphasis on "green" rather than "brown" environmental issues. In principle, one should rank proposed alternative environmental activities according to their estimated IRRs or benefit-cost ratios. But the data needed for such an analysis are not available. Brown issues are expected to addressed mainly by other donors, although both the policy and education components of PROMESA will also deal with some of them.

SOURCE SELECTION INFORMATION

FINANCIAL ANALYSIS

Annex H

This annex includes the detailed budget for computation of project costs. Data for computation of salaries, are taken from recently negotiated contracts. The person-month cost of technical assistance used in the analysis reflect the fully-loaded cost of the assistance. Commodities and training have been costed at an estimate of the base cost plus G&A and fixed fee. However, no break-out of these costs have been made for the commodities and training, due to their relatively small amount within the proposed contract.

The GOES and NGO counterpart contributions are shown with the assumption that the GOES will not increase its outlays for natural resources management in the future, except for inflation.

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The multipliers for Other Direct Costs (ODC), Negotiated Indirect Cost Rate (NICR), and Fixed Fee are estimates from USAID s contracts office, based on recent contract negotiations
Allowances are based on a family of four living at post

Calculation for Costs of Technical Assistance	Base Salary per month	Allowances (all)	Home Office	Fringe 30% salary	O head 80% sal&fr	G&A 15%	Fee 10%	Monthly Cost (incl post diff)
Chief of Party FS 1/10	$7,168	$4,000	$1,792	$2,688	$10,465	$4,132	$3,168	$37,054
Envir Educ Advisor -- FS 2/6	$5,179	$4,000	$1,295	$1,942	$7,561	$3 152	$2,416	$25 286
DA Specialist - FS 2/6	$5,179	$4,000	$1,295	$1,942	$7,561	$3,152	$2,416	$25 286
Training Specialist -- FS 2/6	$5,179	$4,000	$1,295	$1,942	$7,561	$3,152	$2,416	$25,286
Short Term Assistance -- FS 2/6 (average)	$5,179	$4,000		$1,554	$6,215	$2,697	$2,068	$22,748
USJCC Project Manager -- FS2/10	$6,000	$4,000		$2,000	$0	$0	$0	$12 700
Salvadoran Consultant	$1,500	$0		$450	$1,800	$608	$466	$5 123
FNPSC Asst Project Manager FN 11/1	$1,675	$500		$0	$0	$0	$0	$2,175
USJCC Policy Advisor -- FS 2/10	$6,000	$4,000		$2,000	$0	$0	$0	$13,200

Detailed Budget and Cost Estimates

AID Contribution — Dollar funded costs are adjusted for 5% inflation

Component 1 Policy Reform

Description	Loaded Unit Cost dols	LC dol eq	unit	No	FY 93 in dollars	FY 93 in colones	No	FY 94 in dollars	FY 94 in colones	No	FY 95 in dollars	FY 95 in colones
COP/Project Director	$33,054	$0	pm	0	$0	$0	12	$416,479	$0	12	$437,303	$0
Local Office Support												
Support Staff	$0	$4,000	pm	0	$0	$0	12	$0	$50,400	12	$0	$52 920
Operating Expense	$0	$4,000	pm	0	$0	$0	12	$0	$50,400	12	$0	$52 920
Short Term Assistance												$0
Policy/Strategy												
Natl NRM Strategy	$22,748	$0	pm	0	$0	$0	12	$286,629	$0	0	$0	$0
Natl NRM Strategy	$0	$5,123	pm	0	$0	$0	50	$0	$268,971	0	$0	$0
Strategy Seminars	$0	$7,500	budget	0	$0	$0	4	$0	$31,500	3	$0	$25 000
Forestry Law Revision	$22,748	$0	pm	0	$0	$0	2	$47,771	$0	1	$25,080	$0
Forestry Law Revision	$0	$5,123	pm	0	$0	$0	3	$0	$16,138	2	$0	$12,000
Forestry Seminars	$0	$7,500	budget	0	$0	$0	2	$0	$15,750	1	$0	$9,000
Water Law Revision	$22,748	$0	pm	0	$0	$0	2	$47,771	$0	2	$50,160	$0
Water Law Revision	$0	$5,123	pm	0	$0	$0	2	$0	$10,759	2	$0	$12,000
WAter Law Seminars	$0	$7,500	budget	0	$0	$0	2	$0	$15,750	1	$0	$9 000
Fisheries Law Revision	$22,748	$0	pm	0	$0	$0	2	$47,771	$0	1	$25,080	$0
Fisheries Law Revision	$0	$5,123	pm	0	$0	$0	3	$0	$16,138	3	$0	$17,000
Fisheries Law Seminars	$0	$7,500	budget	0	$0	$0	2	$0	$15,750	1	$0	$9 000
Prot Areas Law	$22,748	$0	pm	0	$0	$0	2	$47,771	$0	1	$25,080	$0
Prot Areas Law	$0	$5,123	pm	0	$0	$0	3	$0	$16,138	3	$0	$17 000
Prot Areas Law Seminars	$0	$7,500	budget	0	$0	$0	2	$0	$15,750	1	$0	$9,000
CENTA Regulations	$22,748	$0	pm	0	$0	$0	1	$23,886	$0	1	$25,080	$0
CENTA Regulations	$0	$5,123	pm	0	$0	$0	2	$0	$10,759	2	$0	$12 000
CENTA regulations Seminars	$0	$7,500	budget	0	$0	$0	2	$0	$15,750	1	$0	$9 000
NGO/PVO Linking	$22,748	$0	pm	0	$0	$0	2	$47,771	$0	2	$50,160	$0
NGO/PVO Linking	$0	$5,123	pm	0	$0	$0	4	$0	$21,518	4	$0	$23 000
NGO/PVO Seminars (FOCAM)	$0	$7,500	budget	0	$0	$0	2	$0	$15,750	2	$0	$18,000
Commodities												$0
Office Set-up	$38,000	0	budget	0	$0	$0	1	$40,000	$0	0	$0	$0
Cars/Trucks	$20 000	$0	each	0	$0	$0	1	$21,000	$0	0	$0	$0
Spare Parts and Fuel	$0	$6,000	budget	0	$0	$0	1	$0	$6,300	1	$0	$6 615
LT Training	$1,000	$0	pm	0	$0	$0	15	$15,750	$0	45	$49,613	$0
ST Training	$2 500	$0	pm	0	$0	$0	10	$26,250	$0	10	$27 563	$0
Component 1 Total					$0	$0		$1,068,801	$593,521		$715,118	$293,455

AID Contribution

Component 1 Policy Reform Component One (Outyears and Totals)

Description	No	FY 96 in dollars	FY 96 in colones	No	FY 97 in dollars	FY 97 in colones	No	FY 98 in dollars	FY 98 in colones	No	FY 99 in dollars	FY 99 in colones
COP/Project Director	1	$459,168	$0	12	$482,127	$0	12	$506 233	$0	3	$198 690	$0
Local Office Support												
Support Staff	12	$0	$56,000	12	$0	$59,000	12	$0	$60,000	3	$0	$20 605
Operating Expense	12	$0	$56,000	12	$0	$59,000	12	$0	$60 000	3	$0	$20 600
Short Term Assistance												
Policy/Strategy												
Natl NRM Strategy	0	$0	$0	0	$0	$0	0	$0	$0	0	$0	$0
Natl NRM Strategy	0	$0	$0	0	$0	$0	0	$0	$0	0	$0	$0
Strategy Seminars	2	$0	$18,000	0	$0	$0	0	$0	$	0	$0	$0
Forestry Law Revision	0	$0	$0	0	$0	$0	0	$0	$0	0	$0	$0
Forestry Law Revision	1	$0	$6,000	0	$0	$0	0	$0	$0	0	$0	$0
Forestry Seminars	0	$0	$0	0	$0	$0	0	$0	$0	0	$0	$0
Water Law Revision	0	$0	$0	0	$0	$0	0	$0	$0	0	$0	$0
Water Law Revision		$0	$12 000	0	$0	$0	0	$0	$	0	$0	$0
WAter Law Seminars	0	$0	$0	0	$0	$0	0	$0	$0	0	$0	$0
Fisherie Law Revision	0	$0	$0	0	$0	$0	0	$0	$0	0	$0	$0
Fisheries Law Revision	2	$0	$12 000	0	$0	$0	0	$0	$0	0	$0	$0
Fisheries Law Seminars	0	$0	$0	0	$0	$0	0	$0	$0	0	$0	$0
Prot Areas Law	0	$0	$0	0	$0	$0	0	$0	$0	0	$0	$0
Prot Areas Law	2	$0	$12 000	0	$0	$0	0	$0	$0	0	$0	$0
Prot Areas Law Seminars	0	$0	$0	0	$0	$0	0	$0	$0	0	$0	$0
CENTA Regulations	0	$0	$0	0	$0	$0	0	$0	$0	0	$0	$0
CENTA Regulations	0	$0	$0	0	$0	$0	0	$0	$0	0	$0	$0
CENTA regulations Seminars	0	$0	$0	0	$0	$0	0	$0	$0	0	$0	$0
NGO/PVO Linking	2	$52,668	$0	0	$0	$0	0	$0	$0	0	$0	$0
NGO/PVO Linking	2	$0	$12,000	0	$0	$0	0	$0	$0	0	$0	$0
NGO/PVO Seminars (FOCAM)	2	$0	$18,000	0	$0	$0	0	$0	$0	0	$0	$0
Commodities												
Office Set up	0	$0	$0	0	$0	$0	0	$0	$0	0	$0	$0
Cars/Trucks	1	$23 000	$0	0	$0	$0	0	$0	$0	0	$0	$0
Spare Parts and Fuel	1	$0	$7,000	1	$0	$7,500	1	$0	$7,750	1	$0	$7 889
LT Training	30	$34,637	$0	0	$0	$0	0	$0	$0	0	$0	$0
ST Training	10	$28,941	$0	10	$32,247	$0	0	$0	$0	0	$0	$0
Component 1 Total		$598,414	$209,000		$514,374	$125,500		$506,233	$127,750		$198,690	$49,094

AID Contribution

Component 1 Policy Reform

Description		Totals in dollars	Totals in colones	Totals combined
COP/Project Director	63	$2,500,000	$0	$2,500,000
Local Office Support				
Support Staff	63	$0	$298,925	$298,925
Operating Expense	63	$0	$298,920	$298,920
Short Term Assistance				
Policy/Strategy				
Natl NRM Strategy	12	$286,629	$0	$286,629
Nat NRM Strategy	50	$0	$268,971	$268,971
Strategy Seminars	9	$0	$74,500	$74,500
Forestry Law Revision	3	$72,852	$0	$72,852
Forestry Law Revision	6	$0	$34,138	$34,138
Forestry Seminars	3	$0	$24,750	$24,750
Water Law Revision	4	$97,932	$0	$97,932
Water Law Revision	6	$0	$34,759	$34,759
WAter Law Seminars	3	$0	$24,750	$24,750
Fisheries Law Revision	3	$72,852	$0	$72,852
Fisheries Law Revision	8	$0	$45,138	$45,138
Fisheries Law Seminars	3	$0	$24,750	$24,750
Prot Areas Law		$72,852	$0	$72,852
Prot Areas Law	8	$0	$45,138	$45,138
Prot Areas Law Seminar	3	$0	$24,750	$24,750
CENTA Regulations	7	$48,966	$0	$48,966
CENTA Regulations	4	$0	$22,759	$22,759
CENTA regulations Seminars		$0	$24,750	$24,750
NGO/PVO Linking	6	$150,600	$0	$150,600
NGO/PVO Linking	10	$0	$56,518	$56,518
NGO/PVO Seminars (FOCAM)	6	$0	$51,750	$51,750
Commodities				
Office Set-up	1	$40,000	$0	$40,000
Cars/Trucks	2	$44,000	$0	$44,000
Spare Parts and Fuel	6	$0	$43,054	$43,054
LT Training	90	$100,000	$0	$100,000
ST Training	40	$115,000	$0	$115,000
Component 1 Total		$3,601,681	$1,398,320	$5,000,000
		$3,601,681	$1,398,320	$5,000,000

AID Contribution

Component 2 Environmental Education

Description	Loaded Unit Costs dols	LC dol eq	unit	No	FY 93 in dollars	FY 93 in colones	No	FY 94 in dollars	FY 94 in colones	No	FY 95 in dollars	FY 95 in colones
Env Ed Specialist	$2J 786	$0	pm	0	$0	$0	12	$320 000	$0	12	$745,000	$0
Natl Envir Education Plan												
ST Assistance	$25 286	$0	pm	0	$0	$0	6	$159 302	$0	0	$0	$0
Education Programs												
Formal Education												
ST assistance to MOE	$22 748	$0	pm	0	$0	$0	16	$382 172	$0	3	$75,240	$0
ST ass stance to MOE	$0	$5,123	pm	0	$0	$0	3	$0	$16,138	3	$0	$17 000
MOE Workshops	$0	$7,500	pm	0	$0	$0	3	$0	$2 425	3	$0	$24 836
Mass Media												$0
ST Media Spec alist	$22,748	$0	pm	0	$0	$0	3	$71,657	$0	3	$75,240	$0
ST Media Specialist	$0	$5,123	pm	0	$0	$0	12	$0	$64,553	8	$0	$45 187
Media Workshops	$0	$7,500	pm	0	$0	$0	4	$0	$31 500	4	$0	$ 5,000
Natural Areas												
Interpretive sites	$2 748	$0	pm	0	$0	$0	12	$286,629	$0	12	$305,000	$0
Interpretive sites	$0	$5,123	pm	0	$0	$0	12	$0	$64,553	24	$0	$136,000
Staff Workshops	$0	$7,500	pm	0	$0	$0	6	$0	$47,250	6	$0	$50,000
Agricultural Extension												$0
ST Train CENTA s trainers	$22,748	$0	pm	0	$0	$0	12	$286,629	$0	12	$305,000	$0
ST Train CENTA s trainers	$0	$5,123	pm	0	$0	$0	12	$0	$64,553	12	$0	$70,000
Extension Workshops	$0	$7,500	pm	0	$0	$0	3	$0	$2 ,625	3	$0	$25,000
Commodities												$0
Office Set-up	$38 000	0	budget	0	$0	$0	1	$39,900	$0	0	$0	$0
Cars/trucks	$20,000	0	budget	0	$0	$0	1	$21,000	$0	0	$0	$0
Spare Parts and fuel	$0	$6,000	budget	0	$0	$0	1	$0	$6 300	1	$0	$7,000
LT Training (CA)	$1,000	$0	pm	0	$0	$0	12	$18,000	$0	36	$45,000	$0
ST Training	$ 500	0	pm	0	$0	$0	20	$52,500	$0	15	$42 000	$0
Component 2 Total					$0	$0		$1,637,789	$342,097		$1,192,480	$409,993

AID Contribution

Component 2 Environmental EdComponent Two (Outyears and Totals)

Description	No	FY 96 in dollars	FY 96 in colones	No	FY 97 in dollars	FY 97 in colones	No	FY 98 in dollars	FY 98 in colones	No	FY 99 in dollars	FY 99 in colones
Env Ed Spec'alist	0	$0	$0	0	$0	$0	0	$0	$0	0	$0	$0
Natl Envir Education Plan												
ST Ass stance	0	$0	$0	0	$0	$0	0	$0	$0	0	$0	$0
Education Programs												
Formal Education												
ST assistance to MOE	0	$0	$0	0	$0	$0	0	$0	$0	0	$0	$0
ST assistance to MOE	0	$0	$0	0	$0	$0	0	$0	$0	0	$0	$0
MOE Workshops	0	$0	$0	0	$0	$0	0	$0	$0	0	$0	$0
Mass Media												
ST Media Specialist	3	$80,000	$0	0	$0	$0	0	$0	$0	0	$0	$0
ST Media Specialist	8	$0	$48,000	0	$0	$0	0	$0	$0	0	$0	$0
Media Workshops	4	$0	$35,000	0	$0	$0	0	$0	$0	0	$0	$0
Natural Areas												
Interpretive sites	0	$0	$0	0	$0	$0	0	$0	$0	0	$0	$0
Interpretive sites	12	$0	$72,000	0	$0	$0	0	$0	$0	0	$0	$0
Staff Workshops	4	$0	$35,000	0	$0	$0	0	$0	$0	0	$0	$0
Agricultural Extension												
ST Train CENTA s trainers	4	$110,000	$0	0	$0	$0	0	$0	$0	0	$0	$0
ST Train CENTA s trainers	12	$0	$72,000	12	$0	$75,000	4	$0	$26,640	0	$0	$0
Extension Workshops	3	$0	$27,000	0	$0	$0	0	$0	$0	0	$0	$0
Commodities												
Office Set-up	0	$0	$0	0	$0	$0	0	$0	$0	0	$0	$0
Cars/trucks	0	$0	$0	0	$0	$0	0	$0	$0	0	$0	$0
Spare Parts and fuel	1	$0	$7,000	0	$0	$0	0	$0	$0	0	$0	$0
LT Training (CA)	24	$35,000	$0	0	$0	$0	0	$0	$0	0	$0	$0
ST Training	15	$45,000	$0	0	$0	$0	0	$0	$0	0	$0	$0
Component 2 Total		$270,000	$296,000		$0	$75,000		$0	$26,640		$0	$0

AID Contribution

Component 2 Environmental Education

Description	No	in dollars	in colones	combined
Env Ed Specialist	24	$665,000	$0	$665,000
Natl Envir Education Plan				
ST Assistance	6	$159,302	$0	$159,302
Education Programs				
Formal Education				
ST assistance to MOE	19	$457,412	$0	$457,412
ST assistance to MOE	6	$0	$33,138	$33,138
MOE Workshops	6	$0	$48,431	$48,431
Mass Media				
ST Media Specialist	9	$226,897	$0	$226,897
ST Media Specialist	28	$0	$157,740	$157,740
Media Workshops	12	$0	$101,500	$101,500
Natural Areas				
Interpretive sites	24	$591,629	$0	$591,629
Interpretive sites	48	$0	$272,553	$272,553
Staff Workshops	16	$0	$132,250	$132,250
Agricultural Extension				
ST Train CENTA s trainers	28	$701,629	$0	$701,629
ST Train CENTA s trainers	52	$0	$308,193	$308,193
Extension Workshops	9	$0	$75,625	$75,625
Commodities				
Office Set-up	1	$39,900	$0	$39,900
Cars/trucks	1	$21,000	$0	$21,000
Spare Parts and fuel	3	$0	$20,300	$20,300
LT Training (CA)	72	$98,000	$0	$98,000
ST Training	50	$139,500	$0	$139,500
Component 2 Total		$3,100,270	$1,149,730	$4 250,000
		$3,100,270	$1,149,730	$4,250,000

Component 3 Demonstration of Benefits

Description	Loaded Unit Costs dols	LC dol eq	unit	No	FY 93 in dollars	in colones	No	FY 94 in dollars	in colones	No	FY 95 in dollars	in colones
NRM Specialist	$25 786	$0	pm	0	$0	$0	12	$318,605	$0	12	$334 535	$0
Training Specialist	$25 786	$0	pm	0	$0	$0	9	$238,954	$0	12	$334 535	$0
Logistics Person	$0	$5,123	pm	0	$0	$0	9	$0	$48,415	12	$0	$67,781
Field Office - Guayapa												
Support Staff	$0	$3,000	pm	0	$0	$0	9	$0	$28 350	12	$0	$39,690
Operating Expense	$0	$3,000	pm	0	$0	$0	9	$0	$28 350	12	$0	$39,690
Demonstration Area 1												$0
ST Ecologic Assessment	$22,748	$0	pm	0	$0	$0	6	$143,314	$0	0	$0	$0
ST Assistance - Extension	$22 748	$0	pm	0	$0	$0	4	$95,543	$0	0	$0	$0
ST Assistance - Extension	$0	$5,123	pm	0	$0	$0	19	$0	$10_ 209	19	$0	$107,319
ST Assistance - Training	$22 748	$0	pm	0	$0	$0	6	$143 314	$0	12	$300,960	$0
ST Assistance - Training	$0	$5,123	pm	0	$0	$0	12	$0	$64,553	18	$0	$101,671
ST Assistance - Feedback	$22 748	$0	pm	0	$0	$0	6	$143,314	$0	6	$150,480	$0
ST Assistance - Feedback	$0	$5,123	pm	0	$0	$0	12	$0	$64,553	12	$0	$67,781
Seminars and Worksnops	0	$4,000	budget	0	$0	$0	8	$0	$33 600	8	$0	$35,280
Participation Incentives	$0	$200	budget	0	$0	$0	200	$0	$4 ,000	400	$0	$88 200
Monitoring												
ST Assistance	$22,748	$0	pm	0	$0	$0	6	$143,314	$0	6	$150,480	$0
ST Assistance	$0	$5,123	pm	0	$0	$0	12	$0	$64,553	12	$0	$67,781
Commodities Photos, Imagery	$17,000	$0	budget	0	$0	$0	1	$17,850	$0	1	$18,743	$0
Replication Planning												
Ecologic Assessment												
ST Assistance	$22,748	$0	pm	0	$0	$0	3	$71,657	$0	3	$75,240	$0
ST Assistance	$0	$5,123	pm	0	$0	$0	3	$0	$16,138	3	$0	$16 945
FOLAM Proposal Assistance	$0	$5,123	pm	0	$0	$0	0	$0	$0	0	$0	$0
NGO Subcontracts	$0	$35,000	budget	0	$0	$0	1	$0	$36,750	1	$0	$38,588
Commodities												
Office Set-up	$38,000	0	budget	0	$0	$0	1	$40,000	$0	0	$0	$0
Cars/Trucks	$20,000	$0	each	0	$0	$0	3	$63,000	$0	1	$23,000	$0
Motorcycles	$1 000	$0	each	0	$0	$0	15	$15,750	$0	0	$0	$0
Spare Parts and fuel	$0	$8,000	budget	0	$0	$0	1	$0	$9,000	1	$0	$9,000
Motorboat	$1,500	$0	budget	0	$0	$0	1	$2,500	$0	0	$0	$0
Observational Travel	$2 500	$0	pm	0	$0	$0	12	$35,000	$0	0	$0	$0
ST Training	$2,500	$0	pm	0	$0	$0	10	$30,000	$0	10	$35,000	$0
Component 3 Total					$0	$0		$1,502,116	$538,471		$1,422,973	$679,725

Component 3 Demonstration of Benefits

Component Three (Outyears and Totals)

Description	No	FY 96 in dollars	FY 96 in colones	No	FY 97 in dollars	FY 97 in colones	No	FY 98 in dollars	FY 98 in colones	No	FY 99 in dollars	FY 99 in colones
NRM Specialist	12	$351,262	$0	12	$368,825	$0	12	$387,266	$0	3	$104,508	$0
Training Specialist	12	$354,300	$0	3	$92,211	$0	0	$0	$0	0	$0	$0
Logistics Person	12	$0	$71,170	3	$0	$18,682	0	$0	$0	0	$0	$0
Field Office - Guayapa												
Support Staff	12	$0	$41,675	12	$0	$43,758	12	$0	$45,946	3	$0	$12,061
Operating Expense	12	$0	$41,675	12	$0	$43,758	12	$0	$45,946	3	$0	$12,061
Demonstration Area 1												
ST Ecologic Assessment	0	$0	$0	0	$0	$0	0	$0	$0	0	$0	$0
ST Assistance - Extension	0	$0	$0	0	$0	$0	0	$0	$0	0	$0	$0
ST Assistance - Extension	6	$0	$35,585	6	$0	$37,364	0	$0	$0	0	$0	$0
ST Assistance - Training	0	$0	$0	0	$0	$0	0	$0	$0	0	$0	$0
ST Assistance - Training	0	$0	$0	0	$0	$0	0	$0	$0	0	$0	$0
ST Assistance - Feedback	0	$0	$0	0	$0	$0	0	$0	$0	0	$0	$0
ST Assistance - Feedback	12	$0	$71,170	12	$0	$74,728	0	$0	$0	0	$0	$0
Seminars and Workshops	8	$0	$37,044	0	$0	$0	0	$0	$0	0	$0	$0
Participation Incentives	500	$0	$115,763	400	$0	$97,241	400	$0	$102,103	0	$0	$0
Monitoring												
ST Assistance	0	$0	$0	0	$0	$0	0	$0	$0	0	$0	$0
ST Assistance	12	$0	$71,170	12	$0	$74,728	0	$0	$0	0	$0	$0
Commodities Photos, Imagery	1	$19,680	$0	1	$20,664	$0	1	$21,697	$0	1	$22,787	$0
Replication Planning												
Ecologic Assessment												
ST Assistance	0	$0	$0	0	$0	$0	0	$0	$0	0	$0	$0
ST Assistance	3	$0	$17,792	3	$0	$18,682	3	$0	$19 616	0	$0	$0
FOCAM Proposal Assistance	12	$0	$75,000	12	$0	$80,000	0	$0	$0	0	$0	$0
NGO Subcontracts	2	$0	$81,034	2	$0	$85,085	2	$0	$89,340	0	$0	$0
Commodities												
Office Set-up	0	$0	$0	0	$0	$0	0	$0	$0	0	$0	$0
Cars/Trucks	1	$24,000	$0	2	$48,620	$0	0	$0	$0	0	$0	$0
Motorcycles	0	$0	$0	15	$18,233	$0	0	$0	$0	0	$0	$0
Spare Parts and fuel	1	$0	$9,495	1	$0	$10,000	1	$0	$10,000	1	$0	$10,000
Motorboat	1	$3,000	$0	0	$0	$0	0	$0	$0	0	$0	$0
Observational Travel	0	$0	$0	0	$0	$0	0	$0	$0	0	$0	$0
ST Training	10	$35,000	$0	10	$35,000	$0	0	$0	$0	0	$0	$0
Component 3 Total		$787,241	$668,570		$583,552	$584,027		$408,963	$312,951		$127,290	$34,122

Component 3 Demonstration of Benefits

Description	No	in dollars	in colones	combined
NRM Specialist	6	$1,865,000	$0	$1,865,000
Training Specialist	36	$1,020,000	$0	$1,020,000
Logistics Person	36	$0	$206,047	$206,047
Field Office - Guayaba				
Support Staff	60	$0	$211,480	$211,480
Operating Expense	60	$0	$211,480	$211,480
Demonstration Area				
ST Ecologic Assessment	6	$143,314	$0	$143,314
ST Assistance - Extension	4	$95,543	$0	$95,543
ST Assistance - Extension	50	$0	$282,477	$282,477
ST Assistance - Training	18	$444,275	$0	$444,275
ST Assistance - Training	30	$0	$166,224	$166,224
ST Assistance - Feedback	12	$293,795	$0	$293,795
ST Assistance - Feedback	48	$0	$278,231	$278,231
Seminars and Workshops	24	$0	$105,924	$105,924
Participation Incentives	1900	$0	$445,306	$445,306
Monitoring				
ST Assistance	12	$293,795	$0	$293,795
ST Assistance	48	$0	$278,231	$278,231
Commodities Photos Imagery	6	$121,414	$0	$121,414
Replication Planning				
Ecologic Assessment				
ST Assistance	6	$146,897	$0	$146,897
ST Assistance	15	$0	$89,174	$89,174
FOCAM Proposal Assistance	24	$0	$155,000	$155,000
NGO Subcontracts	8	$0	$330,796	$330,796
Commodities				
Office Set-up	1	$40,000	$0	$40,000
Cars/Trucks	7	$158,620	$0	$158,620
Motorcycles	30	$33,983	$0	$33,983
Spare Parts and Fuel	6	$0	$57,495	$57,495
Motorboat	2	$5,500	$0	$5,500
Observational Travel	12	$35,000	$0	$35,000
ST Training	40	$135,000	$0	$135,000
Component 3 Total		$4,832,136	$2,817,865	$7,650,000
		$4,832,136	$2,817,865	$7,650,000

Detailed Budget and Cost Estimates

USAID-Managed Costs

Description	Unit Cost dols	Unit Cost LC dol eq	unit	No	FY 93 in dollars	FY 93 in colones	No	FY 94 in dollars	FY 94 in colones	No	FY 95 in dollars	FY 95 in colones
USJCC Project manager	$1[illegible],[illegible]00	$0	mo	6	$79,200	$0	12	$166,320	$0	12	$174,636	$0
USJCC Policy Advisor	$13,200	$0	pm	4	$52,800	$0	12	$166,320	$0	12	$174,636	$0
FSN Assistant Project Manager		$2,125	mo	6	$0	$12,750	12	$0	$26,775	12	$0	$28 1[illegible]4
ST Assistance												
FOCAM Organ and Procedures	$22,748	$0	pm	2	$45,497	$0	10	$241,665	$0	0	$0	$0
Initial policy studies	$22,748	$5,123	pm	2	$45,497	$10,247	6	$150,000	$40,000	0	$0	$0
Evaluation (5 pm each)	$80,000	$80,000	budget	0	$0	$0	0	$0	$0	1	$95,000	$95,000
Audit	$0	$69,000	budget	0	$0	$0	1	$0	$77,450	1	$0	$76 07[illegible]
AID Managed Costs Total					$222,993	$22,997		$724,305	$1[illegible]7 225		$444,272	$199 186
TOTAL USAID-FINANCED COSTS					$222,993	$22,997		$4,933,06[illegible]	$1,613,313		$3,774,844	$1,582,359
(Components 1,2,3, USAID-Managed Costs)					$245,990			$6,546,375			$5,357,203	

USAID-Managed Costs

USAID-Managed Costs (Outyears and Totals)

Description	No	FY 96 in dollars	FY 96 in colones	No	FY 97 in dollars	FY 97 in colones	No	FY 98 in dollars	FY 98 in colones	No	FY 99 in dollars	FY 99 in colones
USJCC Project manager	12	$183,368	$0	12	$192,536	$0	12	$202,163	$0	3	$53,068	$0
USJCC Policy Advisor	10	$152,807	$0	0	$0	$0	0	$0	$0	0	$0	$0
FSN Assistant Project Manager	12	$0	$29,519	12	$0	$30,995	12	$0	$32,545	3	$0	$8,547
ST Assistance												
FOCAM Organ and Procedures	0	$0	$0	0	$0	$0	0	$0	$0	0	$0	$0
Initial policy studies	0	$0	$0	0	$0	$0	0	$0	$0	0	$0	$0
Evaluation (5 pm each)	0	$0	$0	0	$0	$0	1	$105,000	$105,000	0	$0	$0
Audit	1	$0	$79,876	1	$0	$83,569	0	$0	$0	1	$0	$88 002
AID Managed Costs Total		$336 174	$109,396		$192,536	$114,564		$307,163	$137 545		$53 068	$96 575
TOTAL USAID-FINANCED COSTS		$1,991,830	$1,282,966		$1,290,462	$899,091		$1,222 359	$604,886		$379,047	$179 791
(Components 1,2,3, USAID-Managed		$3,274,796			$2,189,553			$1,827 245			$558,838	

USAID-Managed Costs

Description	No	Totals in dollars	Totals in colones	Totals combined
USJCC Project manager	69	$1,051,291	$0	$1,051,291
USJCC Policy Advisor	38	$546,563	$0	$546,563
FSN Assistant Project Manager	69	$0	$169,242	$169,242
ST Assistance				
FOCAM Organ and Procedures	12	$287,162	$0	$287,162
Initial policy studies	8	$195,497	$50,247	$245,743
Evaluation (5 pm each)	2	$200,000	$200,000	$400,000
Audit	5	$0	$400,000	$400,000
AID Managed Costs Total		$2,280,512	$819,488	$3,100,000
		$2,280,512	$819,488	$3,100,000
		$13,814,597	$6,185,403	
TOTAL USAID-FINANCED COSTS (Components 1,2,3, USAID-Managed Costs)		$13,814,597	$6,185,403	$20,000,000

Detailed Budget and Cost Estimates

GOES Contribution — Local currency-funded costs are adjusted for 12% inflation

Description	Unit Cost dols	Unit Cost LC dol eq	unit	No	FY 93 in dollars	FY 93 in colones	No	FY 94 in dollars	FY 94 in colones	No	FY 95 in dollars	FY 95 in colones
SEMA												
Project Coordinator	0	$2,000	mo	3		$6,000	6	$0	$13,440	6	$0	$15,053
Staff support	0	$1,000	mo	12		$12,000	24	$0	$26 880	24	$0	$30 106
International Training	0	$800	pm	0		$0	40	$0	$75,840	58	$0	$58,204
Office support	0	5000	mo	6		$30,000	12	$0	$67,200	12	$0	$75,264
Total SEMA Contribution						$48,000			$143,360			$178,627
MAG Directorate General for Natural Resources (DGNR)												
Professional Staff	0	1000	mo	6		$6,000	12	$0	$13,440	12	$0	$15,053
International Training	0	$800	pm	0		$0	20	$0	$17,920	29	$0	$29,102
Forest and Park Guards	0	200	mo	0		$0	50	$0	$11,200	50	$0	$12,544
Total CENREN Contribution						$6,000			$42,560			$56,699
MAG Center for Fisheries Development (CENDEPESCA)												
Professional Staff	0	1000	mo	6		$6,000	12	$0	$13 440	12	$0	$15,053
Field Staff	0	300	mo	6		$1,800	12	$0	$4,032	12	$0	$4,516
Total CENDEPESCA Contribution						$7,800			$17,472			$19,569
CENTA												
Professional Staff	0	1000	mo	6		$6,000	12	$0	$13,440	12	$0	$15,053
International Training	0	$800	pm	0		$0	19	$0	$17 024	29	$0	$29,102
Field Staff	0	300	mo	0		$0	150	$0	$50,400	180	$0	$67,738
Total CENTA Contribution						$6,000			$80,864			$111,892

GOES Contribution

GOES Contribution (Outyears and Totals)

Description	No	FY 96 in dollars	FY 96 in colones	No	FY 97 in dollars	FY 97 in colones	No	FY 98 in dollars	FY 98 in colones	No	FY 99 in dollars	FY 99 in colones
SEMA												
Project Coordinator	6	$0	$16,859	6	$0	$18,882	6	$0	$16,859	2	$0	$6 794
Staff support	24	$0	$33,718	24	$0	$37,764	24	$0	$33,718	6	$0	$9,441
International Training	25	$0	$28,099	5	$0	$6,294	15	$0	$16 859	0	$0	$0
Office support	12	$0	$84,296	12	$0	$94,411	12	$0	$84,296	3	$0	$23,60
Total SEMA Contribution			$162,972			$157,352			$151,732			$39,338
MAG Directorate General for Natural Resources (DGNR)												
Professional Staff	12	$0	$16,859	12	$0	$18,882	12	$0	$16 859	3	$0	$4 721
International Training	13	$0	$14,611	3	$0	$3,776	8	$0	$8,992	0	$0	$0
Forest and Park Guard	50	$0	$14,049	50	$0	$15,735	50	$0	$14,049	0	$0	$0
Total CENREN Contribution			$45,520			$38,394			$39,900			$4,721
MAG Center for Fisheries Development (CENDEPESCA)												
Professional Staff	12	$0	$16,859	12	$0	$18,882	12	$0	$16 859	3	$0	$4,721
Field Staff	12	$0	$5,058	12	$0	$5,665	12	$0	$5 058	3	$0	$1,416
Total CENDEPESCA Contribut on			$21,917			$24,547			$21,917			$6,137
CENTA												
Professional Staff	12	$0	$16,859	12	$0	$18,882	12	$0	$16,859	3	$0	$4,721
International Training	12	$0	$13,487	2	$0	$2,518	7	$0	$7,868	0	$0	$0
Field Staff	180	$0	$75,866	180	$0	$84,970	180	$0	$75,866	45	$0	$21,243
Total CENTA Contribution			$106,213			$106,370			$100,593			$25,963

GOES Contribution

Descript on		Totals in dollars	in colones	combined
SEMA				
Project Coordinator	35	$0	$93,387	$93,387
Staff support	138	$0	$183,628	$183,628
International Training	143	$0	$145,296	$145,296
Office support	69	$0	$459,069	$459,069
Total SEMA Contribution		$0	$881,380	$881 380
			$881,380	$881,380
MAG Directorate General for Natural Resources (DGNR)				
Professional Staff	69	$0	$91,814	$91,814
International Training	73	$0	$74,401	$74,401
Forest and Park Guards	250	$0	$67,578	$67,578
Total CENREN Contribution		$0	$233,793	$233,793
			$233,793	$233,793
MAG Center for Fisheries Development (CENDEPESCA)				
Professional Staff	69	$0	$91,814	$91,814
Field Staff	69	$0	$27,544	$27,544
Total CENDEPESCA Contribution		$0	$119,358	$119,358
			$119,358	$119,358
CENTA				
Professional Staff	69	$0	$91,814	$91,814
International Training	69	$0	$69,999	$69,999
Field Staff	915	$0	$376,082	$376,082
Total CENTA Contribution		$0	$537,895	$537,895
			$537,895	$537,895

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Detailed Budget and Cost Estimates

Source Selection Information

Description	Unit Cost dols	Unit Cost LC dol eq	unit	No	FY 93 in dollars	FY 93 in colones	No	FY 94 in dollars	FY 94 in colones	No	FY 95 in dollars	FY 95 in colones
FOCAM												
LC Grants to NGOs	0	variable	budget			$0		$0	$700,000		$0	$600 000
Total FOCAM Contribution						$0			$700 000			$600 000
MOE Support to Environ Education		1000	mo	0		$0	12	$0	$17,440	12	$0	$15 057
GOES-Financed Costs					$0	$67,800		$0	$597,696		$0	$981,839
Nongovernmental Organizations												
Personnel	0	350	mo	0		$0	0	$0	$0	100	$0	$43 914
In-kind donations	0	25000	budget	0		$0	0	$0	$0	1	$0	$31 360
Total NGO Contribution						$0			$0			$75 264
Total Counterpart Contribution (GOES and NGO)						$67,800			$597,696			$1,057,10
PROJECT TOTALS					$222,993	$90,797		$4,933,062	$2,211,009		$3,774,844	$2,639 463
(USAID, GOES, and NGO Contributions)					$313,790			$7,144,071			$6,414,306	

Detailed Budget and Cost Estimates

Counterpa t Contribution (Outyears and Totals)

Description	No	FY 96 in dollars	FY 96 in colones	No	FY 97 in dollars	FY 97 in colones	No	FY 98 in dollars	FY 98 in colones	No	FY 99 in dollars	FY 99 in colones
FOCAM												
LC Grants to NGOs		$0	$600,000		$0	$1,300,000		$0	$1,300,000		$0	$400 000
Total FOCAM Contribution			$600,000			$1,300,000			$1,300,000			$400 000
MOE Support to Environ Educati	12	$0	$16,859	0	$0	$0	30	$0	$42,148	0	$0	$0
GOES-Financed Costs		$0	$953,480		$0	$1,626,663		$0	$1 656,290		$0	$476,158
Nongovernmantal Organizations												
Personnel	200	$0	$98,345	200	$0	$110,146	200	$0	$120,000	0	$0	$0
In-kind donations	2	$0	$70,246	2	$0	$78,676	2	$0	$87,396	0	$0	$0
Total NGO Contribution			$168,591			$188,822			$207,396			$0
Total Counterpart Contribution (GOES and NGO)			$1,122,071			$1,815,485			$1,863,686			$476,158
PROJECT TOTALS		$1,991,830	$2,405,037		$1,290,462	$2,714,576		$1,222,359	$2,468,572		$379,047	$655,949
(USAID, GOES, and NGO Contribution		$4,396,867			$4,005,038			$3,690,930			$1,034,997	

Description		Totals in dollars	Totals in colones	Totals combined
FOCAM				
LC Grants to NGOs	0	$0	$4,500,000	$4,500,000
Total FOCAM Contribution	0	$0	$4,500,000	$4,500,000
			$4,500,000	$4,500,000
MOE Support to Environ Educati	66	$0	$87,500	$87,500
GOES-Financed Costs		$0	$6,359,926	$6,359,926
		$0	$6,359,926	$6,359,926
Nongovernmental Organi at ons				
Personnel	700	$0	$372,395	$372,395
In-kind donations	7	$0	$267,678	$267,678
Total NGO Contribution		$0	$640,074	$640,074
			$640,074	$640,074
Total Counterpart Contribution (GOES and NGO)		$0	$7,000,000	$7,000,000
PROJECT TOTALS		$13,814,597	$13,185,402	$27,000,000
(USAID, GOES, and NGO Contribution		$13,814,597	$13,185,402	$27,000,000

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	1993	1994	1995	1996	1997	1998	1999	LEAD ENTITY
EOPS 1 Improved policy and financial framework for natural resource use created and implemented								
OUTPUT 1 1 National ENR strategy adopted and periodically updated								
1 1 1 Strengthen SEMA to produce and periodically update the strategy through a participatory process	xxxxx							Contractor
1 1 2 Review experience with similar strategies in other CA countries	xxx							
1 1 3 Carry out workshops and meetings with CONAMA and Asamblea to encourage dialog (OTS Decision Maker Workshops)	xx							SEMA
1 1 4 Consultative meetings with other relevant public and private sector groups and NGOs nationwide	xxxx							SEMA
1 1 5 Prepare draft of strategy	xx							SEMA
1 1 6 Discuss the Strategy in public fora.	xx							SEMA
1 1 7 Incorporate comments and prepare final version of strategy	xx							SEMA
1 1 8 Disseminate the strategy to national groups and international donor community and obtain commitments for participation		xxxxx						SEMA
1 1 9 Update strategy periodically through similar process				oooo		oooo		SEMA
OUTPUT 1 2 Environmental Code Forestry Law and Fisheries Law revised and drafted for legislative process								
1 2 1 Strengthen SEMA CENREN CENDEPESCA through training and TA to prepare legislation through a participatory process	xxx	xxxxx						Contractor
1 2 2 Review existing legislation in ELS and other countries using regional mechanisms (CICAD CCAD and RENARM)	xx							SEMA/CENREN/ CENDEPESCA
1 2 3 Organize national dialogue with GOES and NGOs on on subjects of these environmental laws	xx	xxxxx	xxxxx					SEMA/CENREN/ CENDEPESCA
1 2 4 Carry out specialized studies and policy analyses to support drafting of legislation		xxxxx	xxxxx					IC/SEMA/NGOs
1 2 5 Draft legislation		xxx	xxxxx	xxxxx				SEMA/CENREN/ CENDEPESCA
1 2 6 Submit draft legislation to Asamblea and provide technical backstopping			oooo	oooo				SEMA/CENREN/ CENDEPESCA
1 2 7 Draft Regulations for these laws in consultation with sectors affected			oooo	oooo	ooo			SEMA/CENREN/ CENDEPESCA
1 2 8 Train GOES personnel in application and enforcement of new laws				xxxxx	xxxxx			SEMA/CENREN/ CENDEPESCA

xxxxx = continuous activity ooooo = intermittent activity

		1993	1994	1995	1996	1997	1998	1999	LEAD ENTITY
1 2 9	Disseminate new laws and their implications to public affected				xxxxx	xxxxx	xxxxx		SEMA/CENREN/ CENDEPESCA
OUTPUT 1 3	Enhanced enforcement capacity								
1 3 1	Develop capacity to train forest and park guards and fishery inspectors		xxxxx						CENREN/CENDEPESC
1 3 2	Train guards and inspectors		xxxxx	xxxxx					SEMA/CENREN/ CENDEPESCA
1 3 3	Prepare enforcement plan within demonstration areas		xx						GOES/NGOs
1 3 4	Deploy and equip trained guards in demonstration areas		xxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	SEMA/CENREN/ CENDEPESCA
1 3 5	Motivate and involve local authorities and communities in demonstration areas			xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	Contractor/NGOs
1 3 6	Training for application of natural resource law enforcement.				xxxxx	xxxxx			SEMA
OUTPUT 1 4	Improved capacity to monitor status of natural resources								
1 4 1	Develop plan for monitoring status of natural resources (including definition and purpose of monitoring (minimum data set) mechanism for gathering data (data bases CDC GIS air photos satellite images REA) selection of institutions)	xx							SEMA/NGOs
1 4 2	Set up national Data base system and Clearinghouse								IC/SEMA
1 4 3	In the respective institutions create the capacity to monitor according to the plan		xxxxx						Contractor
1 4 4	Do base line study in demonstration areas using criteria developed in plan		xxx						IC/CENREN
1 4 5	Monitor status of forests soils water marine and estuary life in demonstration areas		xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	CENTA/CENREN CENDEPESCA/NGOs
1 4 6	Use results to influence policy and enforcement (including System of National Accounts)			oooo	oooo	oooo	oooo	oooo	SEMA
OUTPUT 1 5	FOCAM established and functioning as an effective continuing funding mechanism with EAI funds for NGOs								
1 5 1	Provide assistance in setting up U S EAI account.	xxx							USAID
1 5 2	Structure FOCAM Administrative Council and other mechanisms in accordance with EAI requirements	xxx							IC
1 5 3	Strengthen NGOs to utilize FOCAM		xx	xxxxx	xxxxx				IC
1 5 4	Assist NGOs to prepare proposals paired with inter national PVOs to be carried out jointly with FOCAM								

xxxxx = continuous activity ooooo = intermittent activity

	1993	1994	1995	1996	1997	1998	1999	LEAD ENTITY
EOPS 2 Increased public support for the sustainable management of natural resources								
OUTPUTS 2 1 Ministry of Education curriculum is imparting enhanced NRM messages to students in primary school								
2 1 1 Revise curricula to inject ENR message	xxx	xxxxx	xxxxx	xxxxx	xxxxx			SABE
2 1 2 Develop and reproduce materials to train the teachers		xxxxx	xxxxx	xxxxx				SABE
2 1 3 Train the trainers who will train the teachers		xxx	xxxxx	xxxxx	xxxxx	xxxxx		SABE
OUTPUT 2 2 Mass media education program								
2 2 1 Survey public attitudes understanding and behavior concerning ENR issues		xxx						Contractor
2 2 2 Develop a national plan for environmental education (outside of school)		xxx						SEMA/NGOs
2 2 3 Train private environmental and development organizations to carry out mass media campaigns		xx	xxxxx					IC/NGOs
2 2 4 Support enforcement efforts through media campaigns			xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	IC/NGOs
2 2 5 Produce materials			ooooo	ooooo	ooooo	ooooo		IC/NGOs
2 2 6 Obtain media space and time			xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	IC/NGOs
2 2 7 Evaluate effect of educational programs and use results to refine program (Feedback for replication)					xx		xx	NGOs
OUTPUT 2 3 Outreach programs at interpretation sites								
2 3 1 Design and implement environmental interpretation programs on protected lands within the demonstration areas (Coordinated with CENREN)			xxx					IC contracts NGOs and IPVOs
2 3 2 Develop programs to disseminate improved practices to general public (visits by school classes videos guided tours signs posters) (Replication)				xxxxx	xxxxx	xxxxx	xxxxx	Contractor with entities working on site
2 3 3 Construct interpretation centers in areas of special interest (national parks mangroves model farms)				ooooo	ooooo	ooooo		IC/NGO
2 3 4 Construct and operate centers in urban areas for display of environmental subjects for visitation by local inhabitants (e g Botanical Garden)				ooooo	ooooo	ooooo		IC/NGO
OUTPUT 2 4 Capacity to train extensionists in ENR subjects								
2 4 1 Advise CENTA on extension curricula for appropriate injection of ENR subjects	xx							Contractor
2 4 2 Train CENTA instructors through on-the-job training		xxxxx	xxxxx	xxxxx	xxxxx			Contractor

xxxxx = continuous activity ooooo = intermittent activity

		1993	1994	1995	1996	1997	1998	1999	LEAD ENTITY
	and short courses through CATIE and regional TA								
2 4 3	Provide teaching and support materials to CENTA ENR program		oooo	oooo	oooo	oooo	oooo	oooo	Contractor

xxxxx = continuous activity ooooo = intermittent activity

	1993	1994	1995	1996	1997	1998	1999	LEAD ENTITY
EOPS 3 Models for transfer of natural resource management techniques and organizational schemes successfully demonstrated in in selected area incorporated into other project components and replicated in other areas of the country								
OUTPUT 3 1 Natural resource management practices carried out in demonstration area								
3 1 1 Carry out Rapid Ecological Assessment in Demo areas								Contractor
3 1 2 Prepare project work plan for management of the demonstration watershed in collaboration with local communities NGOs and GOES agencies	xx	xx						Contractor
3 1 3 Reach agreement with institutions to collaborate in management of the demonstration area	xx	xxxxx						Contractor
3 1 4 Recruit and train para-extensionists from communities								IC/CENTA
3 1 5 Establish working relationships with local community groups (NGOs) and strengthen them		xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	Contractor
3 1 6 Deploy and supervise guards in protected areas of demonstration area		xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	CENREN
3 1 7 Carry out protection and visitation activities in protected areas		xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	NGOs
3 1 8 Deploy and support trained extensionists in demonstration area		xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	CENTA
3 1 9 Demonstrate improved management practices (agroforestry forestry soil conservation)		xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	CENTA/NGOs
3 1 10 Replant mangrove forests			xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	NGOs
3 1 11 Establish demonstrations of marine resource management disseminate results and replicate elsewhere			xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	NGOs/CENDEPECSA
3 1 12 Carry out economic analyses of Project practices and use results to evaluate and improve practices in demonstration area and elsewhere				ooo	oooo	oooo		Contractor
3 1 13 Use field demonstrations as outreach mechanisms to expand the Project.		xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	CENTA
3 1 12 Organize and support additional community groups to multiply improved practices			xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	IC/CENTA
OUTPUT 3 2 Organizational schemes and incentives for application of NRM practices developed and tested								
3 2 1 Assess local organizations delivery ability need for incentives and potential involvement in the project.	xxx							Contractor
3 2 2 Review the experience of similar projects in El Salvador and neighboring countries through study of documents	xx							Contractor

xxxxx = continuous activity ooooo = intermittent activity

		1993	1994	1995	1996	1997	1998	1999	LEAD ENTITY
3 2 3	Carry out field visits with local leaders and technicians to successful project sites in ELS and neighboring countries	xx	xx						Contractor
3 2 4	Determine organizational and incentive arrangements to be used by the Project (access to markets technical assistance processing and storage facilities credits planting stock sibsidies small local grants etc)		xxx						Contractor
3 2 5	Implement incentive mechanisms including cost sharing and delivery systems incorporate feedback from beneficianes and expand the outreach program		xxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	Contractor
3 2 6	Evaluate improved practices and organizational arrangements to suggest refinements				xx		xx		Contractor
OUTPUT 3 3 Demonstration area experience incorporated into national policy environmental education and replicated in other areas of the country									
3 3 1	Use evaluation results to define a mix of successful practices and organizational arrangements to be extended outside of demonstration area				xxx	xxxxx	xxxxx		Contractor
3 3 2	Use the demonstration area for visits by people who influence policy education and technology transfer			oooo	oooo	oooo	oooo	oooo	Contractor
3 3 3	Use demonstration area as training sites for extensionists park guards fishery inspectors and other technicians of public and private organizations			xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	CENTA
3 3 4	Use demonstration area for field days with campesinos from other areas of ELS			xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	CENTA
3 3 5	Prepare educational materials for use in other parts of the country using examples from demonstration area				xxxxx	xxxxx	xxxxx		Contractor

xxxxx = continuous activity ooooo = intermittent activity

The following is a Technical Assistance and Training Plan described by activity and year which directly supports achievement of the three Project EOPs:

EOPS 1: Improved policy and financial framework for natural resource use created and implemented.

EOPS 2: Increased public support for the sustainable management of natural resources.

EOPS 3: Models for transfer of natural resource management techniques and organizational schemes successfully demonstrated in selected areas, incorporated into other project components, and replicated in other areas of the country.

Training and technical assistance activities are a fundamental part of the Project to upgrade skills and leave behind the human and technological resources needed for sustainable natural resource management in El Salvador beyond the PACD. A funding level of $11,033,775, or 35%, is reserved for short term offshore (390 person months) and national (570 person months) technical assistance activities and training workshops.

Project assistance is focused on providing short-term training in El Salvador, using known natural resource management techniques and materials, provided by experts in the field from either Central America or the United States. Other activities include sending individuals to short courses in other Central and Latin American countries or in the United States. The Institutional Contractor will coordinate training activities with USAID/El Salvador to take advantage of other non-Project funded training opportunities in natural resource management. Training plans will be included in each annual Action Plan submitted by the Institutional Contractor and SEMA.

In addition to technical assistance and training provided by U.S. and Central American sources, the Project will fund workshops and training sessions in El Salvador, phased over the life-of-project. In-country training sessions targetted for each Project component include: 57 for Policy Formulation and Reform; 42 in Environmental Education, and 40 for the Demonstration Areas. An additional 40 sessions are programmed to utilize the Demonstration Areas as observational tools to present PROMESA's techniques to extensionists, farmers, NGOs and others from around the country to promote replication and adoption nationwide. All planned workshops are expected to have an average, optimal attendance of 30 persons per session. Based on this ratio, approximately 5,370

Salvadorans will be incorporated into Project training activities.

Eighteen long term (one year) scholarships are projected for post graduate training to institutions in Central America, including Zamorano, CATIE, and INCAE. INCAE offers a Master's degree in Natural Resource Management (in Spanish) that will be particularly appropriate for Salvadorans from GOES NRM agencies as well as NGOs In addition, four persons may be sent for post graduate courses in the United States. Approximately 130 person months of short-term training courses in the Central American region are anticipated, including for example the marine turtle management course at Tortuguero, Costa Rica. The Training Plan includes the local training of NRM agency personnel and NGOs in techniques that can be transmitted to clients, resource users/managers, and agency personnel, thus multiplying the efforts of the training activities.

At least one long-term (i e. nine months) group of CLASP environmental educators and program implementors will be sent to the U.S. with funding provided by CLASP. A group of CLASP-trained personnel in environmental programs recently returned in August, 1992. These trainees have subsequently been sought out by local environmental NGOs to carry out key technical and managerial assignments. It is anticipated that PROMESA will continue to capitalize on the CLASP short-term training benefits, and to participate in the design of more specific training activities available under the CLASP (e.g. Woods Hole National Laboratory, and Florida State University) which are geared to meet the technical needs of local NGOs and other local environmental entities and their personnel.

The attached Table A shows the person months of technical assistance (in FX or Local Currency) to be provided to each of the Project Outputs which require some element of training or technical assistance provided to group participants. In the far left hand column under the heading "CACM" is the number of person months planned for short-term training programs in the Central American region.

Table B shows the workshop schedule for each Output and cost of the course and materials. Budget allocations for long term (one year) scholarships and short-term courses in Central American countries are also shown.

Table C. shows the person months of short courses in Central America by Project Output, Agency sending the participant, and the Institution that will do the training.

Table A Technical Assistance Plan

		1993	1994	1995	1996	1997	1998	1999	Person Months TA FX	Person Months TA LC
EOPS 1	Improved policy and financial framework for natural resource use created and implemented									
	OUTPUT 1 1 National ENR strategy adopted and periodically updated									
C A 1 1 1	Strengthen SEMA to produce and periodically update the strategy through a participatory process	xxxxx							6	
1 1 3	Carry out workshops and meetings with CONAMA and Asamblea to encourage dialog (OTS Decision Maker Workshops)	xx								9
	OUTPUT 1 2 Environmental Code, Forestry Law, and Fisheries Law revised and drafted for legislative process									
12 1 2 1	Strengthen SEMA, CENREN, CENDEPESCA through training and TA to prepare legislation through a participatory process	xxx	xxxxx						6	
1 2 4	Carry out specialized studies and policy analyses to support drafting of legislation		xxxxx	xxxxx						24
1 2 7	Draft Regulations for these laws in consultation with sectors affected			ooooo	ooooo	ooo			6	
12 1 2 8	Train GOES personnel in application and enforcement of new laws.				xxxxx	xxxxx				6
	OUTPUT 1 3 Enhanced enforcement capacity									
12 1 3 1	Develop capacity to train forest and park guards, and fishery inspectors		xxxxx						6	
1 3 2	Train guards and inspectors		xxxxx	xxxxx						6
1 3 6	Training for application of natural resource law enforcement				xxxxx	xxxxx				10
	OUTPUT 1 4 Improved capacity to monitor status of natural resources									

	1 4 1	Develop plan for monitoring status of natural resources (Including definition and purpose of monitoring, (minimum data set) mechanism for gathering data (data bases, CDC, GIS, air photos, satellite images, REA), selection of institutions)	xx								5
	1 4 2	Set up national Data base system and Clearinghouse									15
4	1 4 3	In the respective institutions, create the capacity to monitor according to the plan		xxxxx							18
	1 4 6	Use results to influence policy and enforcement (including System of National Accounts).			ooooo	ooooo	ooooo	ooooo	ooooo	6	15
	OUTPUT 1 5	FOCAM established and functioning as an effective, continuing funding mechanism with EAI funds for NGOs									
	1 5 1	Provide assistance in setting up U S. EAI account	xxx							6*	
	1 5 3	Strengthen NGOs to utilize FOCAM			xx	xxxxx	xxxxx			12	10
	1 5 4	Assist NGOs to prepare proposals paired with international PVOs to be carried out jointly with FOCAM funding								30	20
40	TOTAL									72	138

* Contracted directly by USAID

EOPS 2 Increased public support for the sustainable management of natural resources											
	OUTPUTS 2 1 Ministry of Education curriculum is imparting enhanced NRM messages to students in primary school										
C A	2 1 1	Revise curricula to inject ENR message	xx	xxxxx	xxxxx	xxxxx	xxxx			42	
	2 1 2	Develop and reproduce materials to train the teachers.		xxxxx	xxxxx	xxxxx				12	
10	2 1 3	Train the trainers who will train the teachers		xxx	xxxxx	xxxxx	xxxxx	xxxxx		12	12
	OUTPUT 2 2 Mass media education program										
	2 2 2	Develop a national plan for environmental education (outside of school)		xxx						12	
20	2.2 3	Train private environmental and development organizations to carry out mass media campaigns		xx	xxxxx					54	24
	OUTPUT 2 3 Outreach programs at interpretation sites										
10	2 3 1	Design and implement environmental interpretation programs on protected lands within the demonstration areas (Coordinated with CENREN)		xxx						36	12
	2 3 2	Develop programs to disseminate improved practices to general public (visits by school classes, videos, guided tours, signs, posters) (Replication)				xxxxx	xxxxx	xxxxx	xxxxx	12	
	2 3 3	Construct interpretation centers in areas of special interest (national parks, mangroves, model farms)				ooooo	ooooo	ooooo		6	6
	2 3 4	Construct and operate centers in urban areas for display of environmental subjects, for visitation by local inhabitants (e g Botanical Garden)				ooooo	ooooo	ooooo		6	6
	OUTPUT 2 4 Capacity to train extensionists in ENR subjects										
	2 4 1	Advise CENTA on extension curricula for appropriate injection of ENR subjects	xx							2	
10	2 4 2	Train CENTA instructors through on-the-job training and short courses through CATIE and regional TA		xxxxx	xxxxx	xxxxx	xxxxx			28	12
50		TOTAL								222	72

	EOPS 3 Models for transfer of natural resource management techniques and organizational schemes success[illegible] demonstrated in in selected areas, [illegible]ther project components, and replicated in other areas of the country									
	OUTPUT 3 1 Natural resource management practices carried out in demonstration areas									
C A	3 1 1 Carry out Rapid Ecological Assessment in Demo areas								6	
	3 1 9 Demonstrate improved management practices (agroforestry, forestry, soil conservation)	xxxx	xxxx	xxxx	xxxx	xxxx	xxxx			144
	3 1 11 Establish demonstrations of marine resource management disseminate results and replicate elsewhere		xxxxx	xxxxx	xxxxx	xxxxx	xxxxx			72
	3 1 13 Use field demonstrations as outreach mechanisms to expand the Project.	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx		24	
	3.1.14 Organize and support additional community groups to multiply improved practices.		xxxxx	xxxxx	xxxxx	xxxxx	xxxxx			42
	OUTPUT 3.2. Organizational schemes and incentives for application of NRM practices developed and tested.									
20	3 2 3 Carry out field visits with local leaders and technicians to successful project sites in ELS and neighboring countries.	xx	xx							
	3 2 4 Determine organizational and incentive arrangements to be used by the Project (access to markets, technical assistance, processing and storage facilities, credits, planting stock, sibsidies, small local grants, etc.)	xxx							12	
10	3 2 5 Implement incentive mechanisms including cost-sharing and delivery systems, incorporate feedback from beneficiaries and expand the outreach program		xxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	12	54
	OUTPUT 3 3 Demonstration area experience incorporated into national policy, environmental education, and replicated in other areas of the country									
	3 3 3 Use demonstration areas as training sites for extensionists, park guards, fishery inspectors and other technicians of public and private organizations			xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	24	24
10	3 3 5 Prepare educational materials for use in other parts of the country, using examples from demonstration area, incorporating feedback into the Env Ed component.				xxxxx	xxxxx	xxxxx		12	24
40	TOTAL								90	760

Table B Workshop Budget and Schedule

($ U S)

	1993	1994	1995	1996	1997	1998	1999
EOPS 1 Improved policy and financial framework for natural resource use created and implemented.							
OUTPUT 1 1 National ENR strategy adopted and periodically updated							
1 1 3 Carry out workshops and meetings with CONAMA and Asamblea to encourage dialog (OTS Decision Maker Workshops)	10000	10000	10000				
1 1 4 Consultative meetings with other relevant public and private sector groups and NGOs nationwide	10000						
OUTPUT 1 2 Environmental Code, Forestry Law, and Fisheries Law revised and drafted for legislative process.							
1 2.1 Strengthen SEMA, CENREN, CENDEPESCA through training and TA to prepare legislation through a participatory process	10000	20000	10000				
1 2 3 Organize national dialogue with GOES and NGOs on on subjects of these environmental laws	5000	10000	10000				
1 2 7 Draft Regulations for these laws in consultation with sectors affected.			10000	10000	5000		
1 2 8 Train GOES personnel in application and enforcement of new laws.			5000	10000	10000		
OUTPUT 1 3 Enhanced enforcement capacity							
1 3 1 Develop capacity to train forest and park guards, and fishery inspectors		5000					
1 3 2 Train guards and inspectors		10000	10000				
1 3 6 Training for application of natural resource law enforcement.				5000	5000		

OUTPUT 1 4. Improved capacity to monitor status of natural resources								
1 4 3 In the respective institutions, create the capacity to monitor according to the plan		30000						
1 4 6 Use results to influence policy and enforcement (including System of National Accounts)			5000	5000	5000	5000	5000	
OUTPUT 1 5. FOCAM established and functioning as an effective, continuing funding mechanism with EAI funds for NGOs								
1 5 3 Strengthen NGOs to utilize FOCAM			10000	10000				
1.5.4 Assist NGOs to prepare proposals paired with international PVOs to be carried out jointly with FOCAM				10000	10000			
Workshop Total	35000	85000	70000	50000	35000	5000	5000	28500
Materials @ 20%	7000	17000	14000	10000	7000	1000	1000	5700
Long term becas (CA @ $7000/yr)		14000	14000	14000	14000			5600
Months of short courses in CA/LA @ $2000/mo		20000	20000	20000	20000			8000
Grand Total								47800

Table C. Schedule for Short Courses in Central America

utput	Year	Pers	Mo	Topic	Agency	Institution
1 2.1	1995	12		NRM Policy	SEMA, CENREN, CENDEFESCA	INCAE, CATIE, OTS
1 2 8	1996	6		NRM enforcement	CENREN, CENDEFESCA	INCAE, OTS
1 2 8	1997	6		NRM enforcement	CENREN, CENDEFESCA	INCAE, OTS
1 3 1	1994	12		Trainers for Park & Forest Guards & Inspect	CENREN, CENDEFESCA	INCAE, OTS
1.4 3	1994	4		NRM Monitoring	CENREN, CENDEPESCA	INCAE, OTS
2 1 3	1995	5		Train Teachers	Min. Education	OTS, NATURA
2.1 3	1996	5		Train Teachers	Min Education	OTS, NATURA
2 2 3	1995	20		Train NGOs in Mass Media Use	NGOs	OTS, NATURA
2.3.1	1995	10		Train Park Svce in Interpretat.	CENREN	OTS, FACA
2 4.2	1994	5		Train CENTA in Agroforestry & Soil Conserva n	CENTA	CATIE
2.4.2	1995	5		Train CENTA in Agroforestry & Soil Conserva n	CENTA	CATIE
3 2 3	1994	20		Field Visits to sites ELS & CA	NGOs, CENTA, local leaders	Honduras, Costa Rica
3 2.5	1994-6	10		Train in implement incentives	NGOs, CENTA	Zamorano, CATIE
3.3 5	1996	10		Training in Ed materials	NGOs, CENTA	CATIE, NATURA

Table [illegible] Schedule for [illegible]

Type	Year	Pers Mo	Topic	Agency	Institution
[illegible] 1	1995	12	NFM Policy	SIMA, CENREN, CENDEFESCA	INCAE, CATIE, OTS
[illegible] 3	1995	[illegible]	NFM enforcement	CENREN, CENDEFESCA	INCAE, OT
1 [illegible] 8	1997		NFM enforcement	CENREN CENDEFESCA	INCAE, OTS
[illegible] 1	1994	1	Training for Park & Forest Guards & Inspect	CENREN, CENDEFE-CA	INCAE, OT
1 4 [illegible]	1994	4	NFM Monitoring	CENREN, CENDEFESCA	INCAE, OTS
[illegible] 1 [illegible]	1995	5	Train Teachers Min	Education	OTS, NATURA
1 [illegible]	1994	5	Train Teachers Min	Education	OTS, NATURA
2 2 [illegible]	1995	20	Train NGOs in Mass Media Use	NGOs	OTS, NATURA
[illegible] 1	1995	10	Train Park Svce in Interpretat	CENREN	OTS, FACA
2 4 [illegible]	1994	5	Train CENTA in Agroforestry & Soil Conserva n	CENTA	CATIE
[illegible] 4 2	1995	5	Train CENTA in Agroforestr & Soil Conserva n	CENTA	CATIE
[illegible]	1994	20	Field Visits to sites ELS & CA	NGOs, CENTA, local leaders	Honduras, Costa Rica
[illegible] 2 5	1994-6	10	Train in implement incentives	NGOs, CENTA	Zamorano, CATIE
[illegible] 5	1996	10	Training in Ed materials	NGOs, CENTA	CATIE, NATURA

Annex K

MINISTERIO DE AGRICULTURA
Y GANADERIA

REPUBLICA DE EL SALVADOR C A
SECRETARIA DE ESTADO

REF D M
No 0034

ACTION COPY

ACTION TO AMS
ACTION DUE 02/12
INFO: ECON IRD/MID
DIR ANR IRD/RUD
DDIR HPN IRD/NRD
AMDO CONT IRD/FRD
RLA OET RSO
CIO CO CSO/S
EXO PRF
PPPO ODI
PRJ IRD
SUBJECT Log. to pursue signature of agreement to Promesa Prog
ACTION TAKEN
DATE
INITIALS

San Salvador, 2 de Febrero de 1993

ASUNTO Solic gestiones para firma convenio aportes al Programa de Medio Ambiente y Sostenibilidad de Recursos Naturales (PROMESA)

Sr John A Sanbrailo
Director
Agencia para el Desarrollo
Internacional
USAID/El Salvador
Presente

USAID / SANSALVADOR
No. 00674
Date: C + R -3 FEB. 1993

Estimado señor Sanbrailo

Por medio de la presente, atentamente me permito saludarlo y hacer referencia a las conversaciones sostenidas por funcionarios del Gobierno de El Salvador y de la Agencia de los Estados Unidos para el Desarrollo Internacional (USAID), en relación al desarrollo de un nuevo Proyecto, PROMESA (Protección del Medio Ambiente Salvadoreño), para la conservación del medio ambiente y la sostenibilidad de recursos naturales

Al respecto, me permito expresar el gran interés que existe de parte del Gobierno de El Salvador y en especial de este Ministerio, en solicitar los servicios ofrecidos a través del Proyecto PROMESA, y a la vez comprometernos a llevar a cabo las siguientes acciones de las cuales corresponden al comienzo eficaz y a la implementación a largo plazo del Proyecto 1) una clarificación del rol de la Secretaría Ejecutiva del Medio Ambiente (SEMA) en términos de limitarla a las funciones específicas de planificación, coordinación y monitoreo para entidades y actividades relacionadas a la conservación de recursos naturales, 2) colocar a SEMA en la ubicación institucional que sea más eficaz, 3) establecer un item permanente en el presupuesto nacional para SEMA y asegurar la estabilidad de su personal, 4) darle la prioridad necesaria para lograr el desarrollo e implementación de una estrategia nacional para conservación del medio ambiente y la sostenibilidad de los recursos naturales, y 5) proporcionar el financiamiento para los gastos locales de contrapartida a la donación Estos gastos incluirían, en términos generales, el financiamiento de personal y recursos logísticos para la plena participación del CENTA, CENREN y CENDEPESCA en las áreas demostrativas y en las actividades de entrenamiento a nivel local y nacional

2/

Sr John A Sanbrailo

Por lo tanto, solicito su valiosa cooperación en el sentido de llevar a cabo las gestiones necesarias a fin de que pueda ser firmado un Convenio de Cooperación entre el Gobierno de El Salvador para apoyar el Proyecto PROMESA

Aprovecho la ocasión para expresarle las muestras de mi consideración y estima

DIOS UNION LIBERTAD

Ing Antonio Cabrales
Ministro de Agricultura
y Ganadería

copia Sra Ministra de Planificación

5C(1) - COUNTRY CHECKLIST

Listed below are statutory criteria applicable to the eligibility of countries to receive the following categories of assistance: (A) both Development Assistance and Economic Support Funds; (B) Development Assistance funds only; or (C) Economic Support Funds only.

A. COUNTRY ELIGIBILITY CRITERIA APPLICABLE TO BOTH DEVELOPMENT ASSISTANCE AND ECONOMIC SUPPORT FUND ASSISTANCE

1. Narcotics Certification

(FAA Sec. 490)· (This provision applies to assistance provided by grant, sale, loan, lease, credit, guaranty, or insurance, except assistance relating to international narcotics control, disaster and refugee relief assistance, narcotics related assistance, or the provision of food (including the monetization of food) or medicine, and the provision of non-agricultural commodities under P L 480 This provision also does not apply to assistance for child survival and AIDS programs which can, under section 542 of the FY 1993 Appropriations Act, be made available notwithstanding any provision of law that restricts assistance to foreign countries) If the recipient is a "major illicit drug producing country" (defined as a country producing during a fiscal year at least five metric tons of opium or 500 metric tons of coca or marijuana) or a "major drug-transit country" (defined as a country that is a significant direct

source of illicit drugs significantly affecting the United States, through which such drugs are transported, or through which significant sums of drug-related profits are laundered with the knowledge or complicity of the government):

(1) has the President in the April 1 International Narcotics Control Strategy Report (INSCR) determined and certified to the Congress (without Congressional enactment, within 45 calendar days, of a resolution disapproving such a certification), that (a) during the previous year the country has cooperated fully with the United States or taken adequate steps on its own to satisfy the goals and objectives established by the U N Convention Against Illicit Traffic in Narcotic Drugs and Psychotropic Substances, or that (b) the vital national interests of the United States require the provision of such assistance? N/A

(2) with regard to a major illicit drug producing or drug-transit country for which the President has <u>not</u> certified on April 1, has the President determined and certified to Congress on any other date (with enactment by Congress of a resolution approving such certification) that the vital national interests of the United States require the provision of assistance, and has also certified that (a) the country has undergone a fundamental change in government, or (b) there has been a fundamental change in the conditions that were the reason why the President had not made a "fully cooperating" certification. N/A

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2 **Indebtedness to U.S. citizens** (FAA Sec. 620(c). If assistance is to a government, is the government indebted to any U.S. citizen for goods or services furnished or ordered where: (a) such citizen has exhausted available legal remedies, (b) the debt is not denied or contested by such government, or (c) the indebtedness arises under an unconditional guaranty of payment given by such government or controlled entity? No

3. **Seizure of U.S. Property** (FAA Sec. 620(e)(1)): If assistance is to a government, has it (including any government agencies or subdivisions) taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of property of U S. citizens or entities beneficially owned by them without taking steps to discharge its obligations toward such citizens or entities? No

4. **Communist countries** (FAA Secs. 620(a), 620(f), 620D; FY 1993 Appropriations Act Secs. 512, 543): Is recipient country a Communist country? If so, has the President· (a) determined that assistance to the country is vital to the security of the United States, that the recipient country is not controlled by No

the international Communist conspiracy, and that such assistance will further promote the independence of the recipient country from international communism, or (b) removed a country from applicable restrictions on assistance to communist countries upon a determination and report to Congress that such action is important to the national interest of the United States? Will assistance be provided either directly or indirectly to Angola, Cambodia, Cuba, Iraq, Libya, Vietnam, Iran or Syria? Will assistance be provided to Afghanistan without a certification, or will assistance be provided inside Afghanistan through the Soviet-controlled government of Afghanistan?

5 **Mob Action** (FAA Sec. 620(j)): Has the country permitted, or failed to take adequate measures to prevent, damage or destruction by mob action of U.S property? — No

6. **OPIC Investment Guaranty** (FAA Sec. 620(l)): Has the country failed to enter into an investment guaranty agreement with OPIC? — No

7. **Seizure of U.S. Fishing Vessels** (FAA Sec 620(o); Fishermen's Protective Act of 1967 (as amended) Sec 5): (a) Has the country seized, or imposed any penalty or sanction against, any U.S. fishing vessel because of fishing activities in international waters? (b) If so, has any deduction required by the Fishermen's Protective Act been made? — No

8 **Loan Default** (FAA Sec. 620(q), FY 1993 Appropriations Act Sec. 518 (Brooke Amendment)): (a) Has the government of the recipient country been in default for more than six months on interest or principal of any loan to the country under the FAA? (b) Has the country been in default for more than one year on interest or principal on any U.S. loan under a program for which the FY 1990 Appropriations Act appropriates funds? — No

9. **Military Equipment** (FAA Sec. 620(s)): If contemplated assistance is development loan or to come from Economic Support Fund, has the Administrator taken into account the percentage of the country's budget and amount of the country's foreign exchange or other resources spent on military equipment? (Reference may be made to the annual "Taking Into Consideration" memo· "Yes, taken into account by the Administrator at time of approval of Agency OYB." This approval by the Administrator of the Operational Year Budget can be the basis for an affirmative answer during the fiscal year unless significant changes in circumstances occur.)

N/A (Grant-funded from the Development Assistance Account)

10 **Diplomatic Relations with U.S.** (FAA Sec. 620(t)): Has the country severed diplomatic relations with the United States? If so, have relations been resumed and have new bilateral assistance agreements been negotiated and entered into since such resumption?

No

11. **U.N. Obligations** (FAA Sec 620(u)). What is the payment status of the country's U.N obligations? If the country is in arrears, were such arrearages taken into account by the A.I D. Administrator in determining the current A I.D. Operational Year Budget? (Reference may be made to the "Taking into Consideration" memo)

12 **International Terrorism**

a. **Sanctuary and support** (FY 1993 Appropriations Act Sec 554, FAA Sec 620A): Has the country been determined by the President to. (a) grant sanctuary from prosecution to any individual or group which has committed an act of international terrorism, or (b) otherwise support international terrorism, unless the President has waived this restriction on grounds of national security or for humanitarian reasons?

No

No

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b. **Airport Security** (ISDCA of 1985 Sec. 552(b). Has the Secretary of State determined that the country is a high terrorist threat country after the Secretary of Transportation has determined, pursuant to section 1115(e)(2) of the Federal Aviation Act of 1958, that an airport in the country does not maintain and administer effective security measures? No

13. **Discrimination** (FAA Sec 666(b)): Does the country object, on the basis of race, religion, national origin or sex, to the presence of any officer or employee of the U.S. who is present in such country to carry out economic development programs under the FAA? No

14. **Nuclear Technology** (FAA Secs. 669, 670): Has the country, after August 3, 1977, delivered to any other country or received nuclear enrichment or reprocessing equipment, materials, or technology, without specified arrangements or safeguards, and without special certification by the President? No

Has it transferred a nuclear explosive device to a non-nuclear weapon state, or if such a state, either received or detonated a nuclear explosive device? No

If the country is a non-nuclear weapon state, has it, on or after August 8, 1985, exported (or attempted to export) illegally from the United States any material, equipment, or technology which would contribute significantly to the ability of a country to manufacture a nuclear explosive device? No (FAA Sec. 620E permits a special waiver of Sec 669 for Pakistan)

15. **Algiers Meeting** (ISDCA of 1981, Sec. 720)· Was the country represented at the Meeting of Ministers of Foreign Affairs and Heads of Delegations of the Non-Aligned Countries to the 36th General Assembly of the U.N. on Sept 25 and 28, 1981, and did it fail to disassociate itself from the communique issued? If so, has the President taken it into account? (Reference may be made to the "Taking into Consideration" memo.)

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16. **Military Coup** (FY 1993 Appropriations Act Sec. 513): Has the duly elected Head of Government of the country been deposed by military coup or decree? If assistance has been terminated, has the President notified Congress that a democratically elected government has taken office prior to the resumption of assistance? — No

17. **Refugee Cooperation** (FY 1993 Appropriations Act Sec 538): Does the recipient country fully cooperate with the international refugee assistance organizations, the United States, and other governments in facilitating lasting solutions to refugee situations, including resettlement without respect to race, sex, religion, or national origin? — Yes

18 **Exploitation of Children** (FAA Sec 116(b)). Does the recipient government fail to take appropriate and adequate measures, within its means, to protect children from exploitation, abuse or forced conscription into military or paramilitary services? — No

B. COUNTRY ELIGIBILITY CRITERIA APPLICABLE ONLY TO DEVELOPMENT ASSISTANCE ("DA")

1. **Human Rights Violations** (FAA Sec. 116): Has the Department of State determined that this government has engaged in a consistent pattern of gross violations of internationally recognized human rights? If so, can it be demonstrated that contemplated assistance will directly benefit the needy? — No

2. **Abortions** (FY 1993 Appropriations Act Sec 534): Has the President certified that use of DA funds by this country would violate any of the prohibitions against use of funds to pay for the performance of abortions as a method of family planning, to motivate or coerce any person to practice abortions, to pay for the performance of involuntary — No

sterilization as a method of family planning, to coerce or provide any financial incentive to any person to undergo sterilizations, to pay for any biomedical research which relates, in whole or in part, to methods of, or the performance of, abortions or involuntary sterilization as a means of family planning?

C COUNTRY ELIGIBILITY CRITERIA APPLICABLE ONLY TO ECONOMIC SUPPORT FUNDS ("ESF")

Human Rights Violations (FAA Sec. 502B): Has it been determined that the country has engaged in a consistent pattern of gross violations of internationally recognized human rights? If so, has the President found that the country made such significant improvement in its human rights record that furnishing such assistance is in the U S. national interest? N/A

5C(2) - ASSISTANCE CHECKLIST

Listed below are statutory criteria applicable to the assistance resources themselves, rather than to the eligibility of a country to receive assistance This section is divided into three parts. Part A includes criteria applicable to both Development Assistance and Economic Support Fund resources. Part B includes criteria applicable only to Development Assistance resources Part C includes criteria applicable only to Economic Support Funds.

CROSS REFERENCE· IS COUNTRY CHECKLIST UP TO DATE?

Yes (copy dated December 14, 1992)

A. CRITERIA APPLICABLE TO BOTH DEVELOPMENT ASSISTANCE AND ECONOMIC SUPPORT FUNDS

1 **Host Country Development Efforts** (FAA Sec. 601(a)). Information and conclusions on whether assistance will encourage efforts of the country to: (a) increase the flow of international trade, (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture, and commerce, and (f) strengthen free labor unions

The Project will improve the efficiency of agriculture through improvement of long-term land use

2 **U.S. Private Trade and Investment** (FAA Sec 601(b)): Information and conclusions on how assistance will encourage U S private trade and investment abroad and encourage private U S participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise)

U S private enterprise will furnish the technical assistance financed under the Project, as well as commodities procured, subject to authorized source/origin waivers

3 **Congressional Notification**

a. **General requirement** (FY 1993 Appropriations Act Sec. 522; FAA Sec. 634A): If money is to be obligated for an activity not previously justified to Congress, or for an amount in excess of amount previously justified to Congress, has Congress been properly notified (unless the Appropriations Act notification requirement has been waived because of substantial risk to human health or welfare)? N/A

b **Notice of new account obligation** (FY 1993 Appropriations Act Sec. 514). If funds are being obligated under an appropriation account to which they were not appropriated, has the President consulted with and provided a written justification to the House and Senate Appropriations Committees and has such obligation been subject to regular notification procedures? N/A

c. **Cash transfers and nonproject sector assistance** (FY 1993 Appropriations Act Sec. 571(b)(3))· If funds are to be made available in the form of cash transfer or nonproject sector assistance, has the Congressional notice included a detailed description of how the funds will be used, with a discussion of U S interests to be served and a description of any economic policy reforms to be promoted? N/A

4 **Engineering and Financial Plans** (FAA Sec 611(a)) Prior to an obligation in excess of $500,000, will there be: (a) engineering, financial or other plans necessary to carry out the assistance, and (b) a reasonably firm estimate of the cost to the U S of the assistance? N/A

5. **Legislative Action** (FAA Sec 611(a)(2)) If legislative action is required within recipient country with respect to an obligation in excess of $500,000, what is the basis for a reasonable expectation that such action

The Ministry of Planning has represented, in its letter request, that it will support the ratification of the Project Agreement by the Legislative Assembly

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will be completed in time to permit orderly accomplishment of the purpose of the assistance?

6. **Water Resources** (FAA Sec. 611(b); FY 1993 Appropriations Act Sec 501): If project is for water or water-related land resource construction, have benefits and costs been computed to the extent practicable in accordance with the principles, standards, and procedures established pursuant to the Water Resources Planning Act (42 U S.C. 1962, et seq)? (See A I.D. Handbook 3 for guidelines.)

N/A

7. **Cash Transfer and Sector Assistance** (FY 1993 Appropriations Act Sec. 571(b)) Will cash transfer or nonproject sector assistance be maintained in a separate account and not commingled with other funds (unless such requirements are waived by Congressional notice for nonproject sector assistance)?

N/A

8 **Capital Assistance** (FAA Sec. 611(e)) If project is capital assistance (e g , construction), and total U.S. assistance for it will exceed $1 million, has Mission Director certified and Regional Assistant Administrator taken into consideration the country's capability to maintain and utilize the project effectively?

N/A

9. **Multiple Country Objectives** (FAA Sec 601(a)). Information and conclusions on whether projects will encourage efforts of the country to (a) increase the flow of international trade; (b) foster private initiative and competition, (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce, and (f) strengthen free labor unions

The Project will increase the efficiency of agricultural production by improving the long-term productivity of farm land

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10. **U.S. Private Trade** (FAA Sec. 601(b)). Information and conclusions on how project will encourage U S. private trade and investment abroad and encourage private U S participation in foreign assistance programs (including use of private trade channels and the services of U.S private enterprise).

U S private enterprise will furnish the technical assistance to be financed under the Project, as well as all commodities, subject to approved source/origin waiver procedures

11. **Local Currencies**

a. **Recipient Contributions** (FAA Secs. 612(b), 636(h)): Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U S. are utilized in lieu of dollars.

GOES and other counterpart contributions are monitored regularly and reported semi annual by the Project Manager Approximately 35% of the Project financing will be disbursed in local currency

b. **U.S.-Owned Currency** (FAA Sec. 612(d)): Does the U.S. own excess foreign currency of the country and, if so, what arrangements have been made for its release?

No

c **Separate Account** (FY 1993 Appropriations Act Sec 571). If assistance is furnished to a foreign government under arrangements which result in the generation of local currencies:

N/A

(1) Has A.I D (a) required that local currencies be deposited in a separate account established by the recipient government, (b) entered into an agreement with that government providing the amount of local currencies to be generated and the terms and conditions under which the currencies so deposited may be utilized, and (c) established by agreement the responsibilities of A.I D. and that government to monitor and account for deposits into and disbursements from the separate account?

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(2) Will such local currencies, or an equivalent amount of local currencies, be used only to carry out the purposes of the DA or ESF chapters of the FAA (depending on which chapter is the source of the assistance) or for the administrative requirements of the United States Government?

(3) Has A.I D taken all appropriate steps to ensure that the equivalent of local currencies disbursed from the separate account are used for the agreed purposes?

(4) If assistance is terminated to a country, will any unencumbered balances of funds remaining in a separate account be disposed of for purposes agreed to by the recipient government and the United States Government?

12 **Trade Restrictions**

a. **Surplus Commodities** (FY 1993 Appropriations Act Sec 520(a)). If assistance is for the production of any commodity for export, is the commodity likely to be in surplus on world markets at the time the resulting productive capacity becomes operative, and is such assistance likely to cause substantial injury to U S. producers of the same, similar or competing commodity? N/A

b. **Textiles (Lautenberg Amendment)** (FY 1993 Appropriations Act Sec. 520(c)) Will the assistance (except for programs in Caribbean Basin Initiative countries under U S. Tariff Schedule "Section 807," which allows reduced tariffs on articles assembled abroad from U.S.-made components) be used directly to procure feasibility studies, prefeasibility studies, or project profiles of potential investment in, or to assist the establishment of facilities specifically designed for, the manufacture for export to the United States or to third country markets in direct competition with U.S. exports, of No

textiles, apparel, footwear, handbags, flat goods (such as wallets or coin purses worn on the person), work gloves or leather wearing apparel?

13 **Tropical Forests** (FY 1991 Appropriations Act Sec 533(c)(3)(as referenced in section 532(d) of the FY 1993 Appropriations Act) Will funds be used for any program, project or activity which would (a) result in any significant loss of tropical forests, or (b) involve industrial timber extraction in primary tropical forest areas?

No

No

14 **PVO Assistance**

a. **Auditing and registration** (FY 1993 Appropriations Act Sec 536) If assistance is being made available to a PVO, has that organization provided upon timely request any document, file, or record necessary to the auditing requirements of A.I D., and is the PVO registered with A.I.D.?

N/A

b **Funding sources** (FY 1993 Appropriations Act, Title II, under heading "Private and Voluntary Organizations"). If assistance is to be made to a United States PVO (other than a cooperative development organization), does it obtain at least 20 percent of its total annual funding for international activities from sources other than the United States Government?

N/A

15 **Project Agreement Documentation** (State Authorization Sec. 139 (as interpreted by conference report)). Has confirmation of the date of signing of the project agreement, including the amount involved, been cabled to State L/T and A I.D LEG within 60 days of the agreement's entry into force with respect to the United States, and has the full text of the agreement been pouched to those same offices? (See Handbook 3, Appendix 6G for agreements covered by this provision).

Documentation will be furnished to State L/T and USAID LEG as required by statue

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16. **Metric System** (Omnibus Trade and Competitiveness Act of 1988 Sec. 5164, as interpreted by conference report, amending Metric Conversion Act of 1975 Sec. 2, and as implemented through A I.D. policy). Does the assistance activity use the metric system of measurement in its procurements, grants, and other business-related activities, except to the extent that such use is impractical or is likely to cause significant inefficiencies or loss of markets to United States firms? Are bulk purchases usually to be made in metric, and are components, subassemblies, and semi-fabricated materials to be specified in metric units when economically available and technically adequate? Will A I D. specifications use metric units of measure from the earliest programmatic stages, and from the earliest documentation of the assistance processes (for example, project papers) involving quantifiable measurements (length, area, volume, capacity, mass and weight), through the implementation stage? Yes

17 **Women in Development** (FY 1993 Appropriations Act, Title II, under heading "Women in Development"): Will assistance be designed so that the percentage of women participants will be demonstrably increased? No

18. **Regional and Multilateral Assistance** (FAA Sec. 209). Is assistance more efficiently and effectively provided through regional or multilateral organizations? If so, why is assistance not so provided? Information and conclusions on whether assistance will encourage developing countries to cooperate in regional development programs. No

19 **Abortions** (FY 1993 Appropriations Act, Title II, under heading "Population, DA," and Sec 524):

a. Will assistance be made available to any organization or program which, as determined by the President, supports or participates in the management of a program of coercive abortion or involuntary sterilization? — No

b Will any funds be used to lobby for abortion? — No

20. **Cooperatives** (FAA Sec. 111): Will assistance help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward a better life? — No

21. **U.S.-Owned Foreign Currencies**

a. **Use of currencies** (FAA Secs. 612(b), 636(h); FY 1993 Appropriations Act Secs 507, 509) Are steps being taken to assure that, to the maximum extent possible, foreign currencies owned by the U S. are utilized in lieu of dollars to meet the cost of contractual and other services — Project funds to be expended in local currency will be disbursed in local currency rather than in dollars

b. **Release of currencies** (FAA Sec. 612(d)) Does the U S. own excess foreign currency of the country and, if so, what arrangements have been made for its release? — No

22 **Procurement**

a. **Small business** (FAA Sec. 602(a)): Are there arrangements to permit U S small business to participate equitably in the furnishing of commodities and services financed? — Yes

b **U.S. procurement** (FAA Sec. 604(a) as amended by section 597 of the FY 1993 Appropriations Act): Will all procurement be from the U S , the recipient country, or developing countries except as otherwise determined in accordance with the criteria of this section? — Yes

c. **Marine insurance** (FAA Sec. 604(d)) If the cooperating country discriminates against marine insurance companies authorized to do business in the U.S., will commodities be insured in the United States against marine risk with such a company? — N/A

d. **Non-U.S. agricultural procurement** (FAA Sec. 604(e)): If non-U S procurement of agricultural commodity or product thereof is to be financed, is there provision against such procurement when the domestic price of such commodity is less than parity? (Exception where commodity financed could not reasonably be procured in U S) — N/A

e. **Construction or engineering services** (FAA Sec. 604(g)): Will construction or engineering services be procured from firms of advanced developing countries which are otherwise eligible under Code 941 and which have attained a competitive capability in international markets in one of these areas? (Exception for those countries which receive direct economic assistance under the FAA and permit United States firms to compete for construction or engineering services financed from assistance programs of these countries) — N/A

f **Cargo preference shipping** (FAA Sec. 603)): Is the shipping excluded from compliance with the requirement in section 901(b) of the Merchant Marine Act of 1936, as amended, that at least 50 percent of the gross tonnage of commodities (computed separately for dry bulk carriers, dry cargo liners, and tankers) financed shall be transported on privately owned U.S flag commercial vessels to the extent such vessels are available at fair and reasonable rates? — No

g **Technical assistance** (FAA Sec 621(a)): If technical assistance is financed, will such assistance be furnished by private enterprise on a contract basis to the fullest extent practicable? Will the — Project assistance will be 100% for contracted assistance from the private sector

facilities and resources of other Federal agencies be utilized, when they are particularly suitable, not competitive with private enterprise, and made available without undue interference with domestic programs?

h. **U.S. air carriers** (International Air Transportation Fair Competitive Practices Act, 1974). If air transportation of persons or property is financed on grant basis, will U.S. carriers be used to the extent such service is available? — Yes

i. **Termination for convenience of U.S. Government** (FY 1993 Appropriations Act Sec. 504): If the U.S Government is a party to a contract for procurement, does the contract contain a provision authorizing termination of such contract for the convenience of the United States? — Yes

j. **Consulting services** (FY 1993 Appropriations Act Sec. 523). If assistance is for consulting service through procurement contract pursuant to 5 U.S C. 3109, are contract expenditures a matter of public record and available for public inspection (unless otherwise provided by law or Executive order)? — Yes

k. **Metric conversion** (Omnibus Trade and Competitiveness Act of 1988, as interpreted by conference report, amending Metric Conversion Act of 1975 Sec 2, and as implemented through A I.D. policy) Does the assistance program use the metric system of measurement in its procurements, grants, and other business-related activities, except to the extent that such use is impractical or is likely to cause significant inefficiencies or loss of markets to United States firms? Are bulk purchases usually to be made in metric, and are components, subassemblies, and semi-fabricated materials to be specified in metric units when economically available and technically adequate? Will A.I D. specifications use metric units of measure from the earliest programmatic stages, and from the earliest — Yes

documentation of the assistance processes (for example, project papers) involving quantifiable measurements (length, area, volume, capacity, mass and weight), through the implementation stage?

1. **Competitive Selection Procedures** (FAA Sec. 601(e))· Will the assistance utilize competitive selection procedures for the awarding of contracts, except where applicable procurement rules allow otherwise? — Yes

23. **Construction**

a. **Capital project** (FAA Sec. 601(d)): If capital (e g , construction) project, will U S. engineering and professional services be used? — N/A

b. **Construction contract** (FAA Sec 611(c)): If contracts for construction are to be financed, will they be let on a competitive basis to maximum extent practicable? — N/A

c **Large projects, Congressional approval** (FAA Sec 620(k)): If for construction of productive enterprise, will aggregate value of assistance to be furnished by the U S. not exceed $100 million (except for productive enterprises in Egypt that were described in the Congressional Presentation), or does assistance have the express approval of Congress? — N/A

24 **U.S. Audit Rights** (FAA Sec 301(d)). If fund is established solely by U.S. contributions and administered by an international organization, does Comptroller General have audit rights? — N/A

25 **Communist Assistance** (FAA Sec. 620(h). Do arrangements exist to insure that United States foreign aid is not used in a manner which, contrary to the best interests of the United States, promotes or assists the foreign aid projects or activities of the Communist-bloc countries? — N/A

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26 **Narcotics**

a. **Cash reimbursements** (FAA Sec 483): Will arrangements preclude use of financing to make reimbursements, in the form of cash payments, to persons whose illicit drug crops are eradicated? Yes

b **Assistance to narcotics traffickers** (FAA Sec. 487): Will arrangements take "all reasonable steps" to preclude use of financing to or through individuals or entities which we know or have reason to believe have either: (1) been convicted of a violation of any law or regulation of the United States or a foreign country relating to narcotics (or other controlled substances); or (2) been an illicit trafficker in, or otherwise involved in the illicit trafficking of, any such controlled substance? Yes

27 **Expropriation and Land Reform** (FAA Sec. 620(g)): Will assistance preclude use of financing to compensate owners for expropriated or nationalized property, except to compensate foreign nationals in accordance with a land reform program certified by the President? Yes

28 **Police and Prisons** (FAA Sec. 660) Will assistance preclude use of financing to provide training, advice, or any financial support for police, prisons, or other law enforcement forces, except for narcotics programs? No

29 **CIA Activities** (FAA Sec. 662): Will assistance preclude use of financing for CIA activities? Yes

30 **Motor Vehicles** (FAA Sec 636(i))· Will assistance preclude use of financing for purchase, sale, long-term lease, exchange or guaranty of the sale of motor vehicles manufactured outside U.S , unless a waiver is obtained? Yes

31. **Military Personnel** (FY 1993 Appropriations Act Sec. 503): Will assistance preclude use of financing to pay pensions, annuities, retirement pay, or adjusted service compensation for prior or current military personnel? Yes

32. **Payment of U.N. Assessments** (FY 1993 Appropriations Act Sec 505): Will assistance preclude use of financing to pay U N assessments, arrearages or dues? Yes

33. **Multilateral Organization Lending** (FY 1993 Appropriations Act Sec. 506). Will assistance preclude use of financing to carry out provisions of FAA section 209(d) (transfer of FAA funds to multilateral organizations for lending)? Yes

34. **Export of Nuclear Resources** (FY 1993 Appropriations Act Sec. 510): Will assistance preclude use of financing to finance the export of nuclear equipment, fuel, or technology? Yes

35. **Repression of Population** (FY 1993 Appropriations Act Sec. 511): Will assistance preclude use of financing for the purpose of aiding the efforts of the government of such country to repress the legitimate rights of the population of such country contrary to the Universal Declaration of Human Rights? Yes

36. **Publicity or Propaganda** (FY 1993 Appropriations Act Sec. 516): Will assistance be used for publicity or propaganda purposes designed to support or defeat legislation pending before Congress, to influence in any way the outcome of a political election in the United States, or for any publicity or propaganda purposes not authorized by Congress? No

37. **Marine Insurance** (FY 1993 Appropriations Act Sec. 560): Will any A I D. contract and solicitation, and subcontract entered into under such contract, include a clause requiring that U S marine insurance companies have a fair opportunity to bid for marine insurance when such insurance is necessary or appropriate? — Yes

38. **Exchange for Prohibited Act** (FY 1993 Appropriations Act Sec. 565): Will any assistance be provided to any foreign government (including any instrumentality or agency thereof), foreign person, or United States person in exchange for that foreign government or person undertaking any action which is, if carried out by the United States Government, a United States official or employee, expressly prohibited by a provision of United States law? — No

39 **Commitment of Funds** (FAA Sec. 635(h))· Does a contract or agreement entail a commitment for the expenditure of funds during a period in excess of 5 years from the date of the contract or agreement? — Yes The main technical assistance contract is anticipated to be let for services over a period of 5½ years

40. **Impact on U.S. Jobs** (FY 1993 Appropriations Act, Sec. 599):

(a) Will any financial incentive be provided to a business located in the U.S. for the purpose of inducing that business to relocate outside the U.S in a manner that would likely reduce the number of U S. employees of that business? — No

(b) Will assistance be provided for the purpose of establishing or developing an export processing zone or designated area in which the country's tax, tariff, labor, environment, and safety laws do not apply? If so, has the President determined and certified that such assistance is not likely to cause a loss of jobs within the U S.? — No

(c) Will assistance be provided for a project or activity that contributes to the violation of internationally recognized workers rights, as defined in section 502(a)(4) of the Trade Act of 1974, of workers in the recipient country? — No

B CRITERIA APPLICABLE TO DEVELOPMENT ASSISTANCE ONLY

1 **Agricultural Exports (Bumpers Amendment)** (FY 1993 Appropriations Act Sec. 521(b), as interpreted by conference report for original enactment)· If assistance is for agricultural development activities (specifically, any testing or breeding feasibility study, variety improvement or introduction, consultancy, publication, conference, or training), are such activities: (1) specifically and principally designed to increase agricultural exports by the host country to a country other than the United States, where the export would lead to direct competition in that third country with exports of a similar commodity grown or produced in the United States, and can the activities reasonably be expected to cause substantial injury to U S. exporters of a similar agricultural commodity; or (2) in support of research that is intended primarily to benefit U.S. producers? — N/A

2. **Tied Aid Credits** (FY 1993 Appropriations Act, Title II, under heading "Economic Support Fund"). Will DA funds be used for tied aid credits? — No

3. **Appropriate Technology** (FAA Sec 107) Is special emphasis placed on use of appropriate technology (defined as relatively smaller, cost-saving, labor-using technologies that are generally most appropriate for the small farms, small businesses, and small incomes of the poor)? — The project will promote agricultural practices which minimize erosion, waterloss, and deforestation without adverse effect on small farmers

4 **Indigenous Needs and Resources** (FAA Sec 281(b)) Describe extent to which the activity recognizes the particular needs, desires, and capacities of the people of the country; utilizes the country's intellectual resources to encourage institutional development; and supports civic education and training in skills required for effective participation in governmental and political processes essential to self-government.	The Project will use local groups in selecting the mix of erosion control and reforestation Measures to be selected and implemented in the demonstration areas
5. **Economic Development** (FAA Sec 101(a)): Does the activity give reasonable promise of contributing to the development of economic resources, or to the increase of productive capacities and self-sustaining economic growth?	Yes
6. **Special Development Emphases** (FAA Secs. 102(b), 113, 281(a)): Describe extent to which activity will: (a) effectively involve the poor in development by extending access to economy at local level, increasing labor-intensive production and the use of appropriate technology, dispersing investment from cities to small towns and rural areas, and insuring wide participation of the poor in the benefits of development on a sustained basis, using appropriate U S. institutions, (b) encourage democratic private and local governmental institutions, (c) support the self-help efforts of developing countries, (d) promote the participation of women in the national economies of developing countries and the improvement of women's status; and (e) utilize and encourage regional cooperation by developing countries.	The project will assist poor farmers to obtain a sustained crop yield from their land while reducing soil loss Further, Project- financed assistance will promote reforestation, helping to ensure a sustainable supply of fuelwood for family use
7 **Recipient Country Contribution** (FAA Secs 110, 124(d)) Will the recipient country provide at least 25 percent of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or is the latter cost-sharing requirement being waived for a "relatively least developed" country)?	Yes

8 **Benefit to Poor Majority** (FAA Sec. 128(b)). If the activity attempts to increase the institutional capabilities of private organizations or the government of the country, or if it attempts to stimulate scientific and technological research, has it been designed and will it be monitored to ensure that the ultimate beneficiaries are the poor majority? — Yes

9. **Abortions** (FAA Sec. 104(f); FY 1993 Appropriations Act, Title II, under heading "Population, DA," and Sec. 534):

a. Are any of the funds to be used for the performance of abortions as a method of family planning or to motivate or coerce any person to practice abortions? — No

b Are any of the funds to be used to pay for the performance of involuntary sterilization as a method of family planning or to coerce or provide any financial incentive to any person to undergo sterilizations? — No

c Are any of the funds to be made available to any organization or program which, as determined by the President, supports or participates in the management of a program of coercive abortion or involuntary sterilization? — No

d. Will funds be made available only to voluntary family planning projects which offer, either directly or through referral to, or information about access to, a broad range of family planning methods and services? — No

e In awarding grants for natural family planning, will any applicant be discriminated against because of such applicant's religious or conscientious commitment to offer only natural family planning? — No

f. Are any of the funds to be used to pay for any biomedical research which relates, in whole or in part, to — No

methods of, or the performance of, abortions or involuntary sterilization as a means of family planning?

g. Are any of the funds to be made available to any organization if the President certifies that the use of these funds by such organization would violate any of the above provisions related to abortions and involuntary sterilization? — No

10 **Contract Awards** (FAA Sec. 601(e)). Will the project utilize competitive selection procedures for the awarding of contracts, except where applicable procurement rules allow otherwise? — Yes

11. **Disadvantaged Enterprises** (FY 1993 Appropriations Act Sec. 563): What portion of the funds will be available only for activities of economically and socially disadvantaged enterprises, historically black colleges and universities, colleges and universities having a student body in which more than 40 percent of the students are Hispanic Americans, and private and voluntary organizations which are controlled by individuals who are black Americans, Hispanic Americans, or Native Americans, or who are economically or socially disadvantaged (including women)? — The Project does not set aside funds for specific 8(a) procurements Full and open competition will be used for all project procurement in order to provide the widest possible access to the planned contracts

12. **Biological Diversity** (FAA Sec. 119(g) Will the assistance (a) support training and education efforts which improve the capacity of recipient countries to prevent loss of biological diversity; (b) be provided under a long-term agreement in which the recipient country agrees to protect ecosystems or other wildlife habitats; (c) support efforts to identify and survey ecosystems in recipient countries worthy of protection, or (d) by any direct or indirect means significantly degrade national parks or similar protected areas or introduce exotic plants or animals into such areas?

a) Yes

b) No

c) Yes

d) No

13. **Tropical Forests** (FAA Sec. 118; FY 1991 Appropriations Act Sec. 533(c) as referenced in section 532(d) of the FY 1993 Appropriations Act):

a. **A.I.D. Regulation 16:** Does the assistance comply with the environmental procedures set forth in A I D Regulation 16? — Yes

b **Conservation:** Does the assistance place a high priority on conservation and sustainable management of tropical forests? Specifically, does the assistance, to the fullest extent feasible (1) stress the importance of conserving and sustainably managing forest resources, (2) support activities which offer employment and income alternatives to those who otherwise would cause destruction and loss of forests, and help countries identify and implement alternatives to colonizing forested areas, (3) support training programs, educational efforts, and the establishment or strengthening of institutions to improve forest management; (4) help end destructive slash-and-burn agriculture by supporting stable and productive farming practices, (5) help conserve forests which have not yet been degraded by helping to increase production on lands already cleared or degraded; (6) conserve forested watersheds and rehabilitate those which have been deforested; (7) support training, research, and other actions which lead to sustainable and more environmentally sound practices for timber harvesting, removal, and processing; (8) support research to expand knowledge of tropical forests and identify alternatives which will prevent forest destruction, loss, or degradation, (9) conserve biological diversity in forest areas by supporting efforts to identify, establish, and maintain a representative network of protected tropical forest ecosystems on a worldwide basis, by making the establishment of protected areas a condition of support for activities involving forest clearance or degradation,

1) Yes
2) No
3) Yes
4) No
5) No
6) Yes
7) No
8) Yes
9) Yes
10) No
11) Yes
12) Yes
13) Yes

and by helping to identify tropical forest ecosystems and species in need of protection and establish and maintain appropriate protected areas, (10) seek to increase the awareness of U.S. Government agencies and other donors of the immediate and long-term value of tropical forests; (11) utilize the resources and abilities of all relevant U.S. government agencies; (12) be based upon careful analysis of the alternatives available to achieve the best sustainable use of the land; and (13) take full account of the environmental impacts of the proposed activities on biological diversity?

c. **Forest degradation:** Will assistance be used for: (1) the procurement or use of logging equipment, unless an environmental assessment indicates that all timber harvesting operations involved will be conducted in an environmentally sound manner and that the proposed activity will produce positive economic benefits and sustainable forest management systems; (2) actions which will significantly degrade national parks or similar protected areas which contain tropical forests, or introduce exotic plants or animals into such areas; (3) activities which would result in the conversion of forest lands to the rearing of livestock, (4) the construction, upgrading, or maintenance of roads (including temporary haul roads for logging or other extractive industries) which pass through relatively undergraded forest lands, (5) the colonization of forest lands, or (6) the construction of dams or other water control structures which flood relatively undergraded forest lands, unless with respect to each such activity an environmental assessment indicates that the activity will contribute significantly and directly to improving the livelihood of the rural poor and will be conducted in an environmentally sound manner which supports sustainable development?

1-6) No

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d **Sustainable forestry:** If assistance relates to tropical forests, will project assist countries in developing a systematic analysis of the appropriate use of their total tropical forest resources, with the goal of developing a national program for sustainable forestry?	Yes
e. **Environmental impact statements:** Will funds be made available in accordance with provisions of FAA Section 117(c) and applicable A.I.D. regulations requiring an environmental impact statement for activities significantly affecting the environment?	Yes
14. **Energy** (FY 1991 Appropriations Act Sec 533(c) as referenced in section 532(d) of the FY 1993 Appropriations Act): If assistance relates to energy, will such assistance focus on (a) end-use energy efficiency, least-cost energy planning, and renewable energy resources, and (b) the key countries where assistance would have the greatest impact on reducing emissions from greenhouse gases?	The project will promote sustainable harvesting of fuelwood
15. **Debt-for-Nature Exchange** (FAA Sec 463) If project will finance a debt-for-nature exchange, describe how the exchange will support protection of: (a) the world's oceans and atmosphere, (b) animal and plant species, and (c) parks and reserves; or describe how the exchange will promote· (d) natural resource management, (e) local conservation programs, (f) conservation training programs, (g) public commitment to conservation, (h) land and ecosystem management, and (i) regenerative approaches in farming, forestry, fishing, and watershed management.	N/A
16. **Deobligation/Reobligation** (FY 1993 Appropriations Act Sec 515) If deob/reob authority is sought to be exercised in the provision of DA assistance, are the funds being obligated for the same general purpose, and for countries within the same region as	N/A

originally obligated, and have the House and Senate Appropriations Committees been properly notified?

17 **Loans**

a. **Repayment capacity** (FAA Sec. 122(b))· Information and conclusion on capacity of the country to repay the loan at a reasonable rate of interest. N/A

b. **Long-range plans** (FAA Sec 122(b)). Does the activity give reasonable promise of assisting long-range plans and programs designed to develop economic resources and increase productive capacities? N/A

c. **Interest rate** (FAA Sec. 122(b)): If development loan is repayable in dollars, is interest rate at least 2 percent per annum during a grace period which is not to exceed ten years, and at least 3 percent per annum thereafter? N/A

d. **Exports to United States** (FAA Sec. 620(d)). If assistance is for any productive enterprise which will compete with U S. enterprises, is there an agreement by the recipient country to prevent export to the U S. of more than 20 percent of the enterprise's annual production during the life of the loan, or has the requirement to enter into such an agreement been waived by the President because of a national security interest? N/A

18 **Development Objectives** (FAA Secs 102(a), 111, 113, 281(a))· Extent to which activity will (1) effectively involve the poor in development, by expanding access to economy at local level, increasing labor-intensive production and the use of appropriate technology, spreading investment out from cities to small towns and rural areas, and insuring wide participation of the poor in the benefits of development on a sustained basis, using the appropriate U.S. institutions; (2) help develop cooperatives, especially by technical

The Project will involve local residents in decisions on slowing erosion, conserving water resources, and reforestation By reducing the amount of time spent on fuelwood gathering and water carrying, the women whose traditional roles these are, will be more likely to participate in the cash economy

assistance, to assist rural and urban poor to help themselves toward better life, and otherwise encourage democratic private and local governmental institutions; (3) support the self-help efforts of developing countries, (4) promote the participation of women in the national economies of developing countries and the improvement of women's status, and (5) utilize and encourage regional cooperation by developing countries?

19. **Agriculture, Rural Development and Nutrition,** and **Agricultural Research** (FAA Secs. 103 and 103A):

a **Rural poor and small farmers:** If assistance is being made available for agriculture, rural development or nutrition, describe extent to which activity is specifically designed to increase productivity and income of rural poor, or if assistance is being made available for agricultural research, has account been taken of the needs of small farmers, and extensive use of field testing to adapt basic research to local conditions shall be made.

Soil erosion and water loss control will increase agricultural productivity over the long-term In order to safeguard the productivity of small family farmers, project assistance will pass on sustainable, low-cost approaches to agriculture

b. **Nutrition:** Describe extent to which assistance is used in coordination with efforts carried out under FAA Section 104 (Population and Health) to help improve nutrition of the people of developing countries through encouragement of increased production of crops with greater nutritional value, improvement of planning, research, and education with respect to nutrition, particularly with reference to improvement and expanded use of indigenously produced foodstuffs; and the undertaking of pilot or demonstration programs explicitly addressing the problem of malnutrition of poor and vulnerable people.

N/A

c. **Food security:** Describe extent to which activity increases national food security by improving food policies and management and by strengthening national food reserves, with particular concern for the needs of the

N/A

poor, through measures encouraging domestic production, building national food reserves, expanding available storage facilities, reducing post harvest food losses, and improving food distribution.

20. **Population and Health** (FAA Secs. 104(b) and (c)). If assistance is being made available for population or health activities, describe extent to which activity emphasizes low-cost, integrated delivery systems for health, nutrition and family planning for the poorest people, with particular attention to the needs of mothers and young children, using paramedical and auxiliary medical personnel, clinics and health posts, commercial distribution systems, and other modes of community outreach.

N/A

21 **Education and Human Resources Development** (FAA Sec. 105): If assistance is being made available for education, public administration, or human resource development, describe (a) extent to which activity strengthens nonformal education, makes formal education more relevant, especially for rural families and urban poor, and strengthens management capability of institutions enabling the poor to participate in development; and (b) extent to which assistance provides advanced education and training of people of developing countries in such disciplines as are required for planning and implementation of public and private development activities

Project assistance will strengthen the presentation of environmental education both in the formal primary school curriculum and through informal education such as radio and print media The demonstration areas will use participative methods in planning land use programs

22 **Energy, Private Voluntary Organizations, and Selected Development Activities** (FAA Sec 106). If assistance is being made available for energy, private voluntary organizations, and selected development problems, describe extent to which activity is.

a concerned with data collection and analysis, the training of skilled personnel, research on and development of suitable energy sources, and pilot projects to test new methods of energy production; and facilitative of

GOES and local NGOs will receive staff training in fuelwood management as part of reforestation activities

research on and development and use of small-scale, decentralized, renewable energy sources for rural areas, emphasizing development of energy resources which are environmentally acceptable and require minimum capital investment;

b concerned with technical cooperation and development, especially with U.S. private and voluntary, or regional and international development, organizations, — N/A

c research into, and evaluation of, economic development processes and techniques, — N/A

d. reconstruction after natural or manmade disaster and programs of disaster preparedness; — N/A

e for special development problems, and to enable proper utilization of infrastructure and related projects funded with earlier U.S. assistance; — N/A

f for urban development, especially small, labor-intensive enterprises, marketing systems for small producers, and financial or other institutions to help urban poor participate in economic and social development. — N/A

23. **Capital Projects** (Jobs Through Export Act of 1992, Secs 303 and 306(d)). If assistance is being provided for a capital project, is the project developmentally sound and will the project measurably alleviate the worst manifestations of poverty or directly promote environmental safety and sustainability at the community level? — Yes The Project will specifically promote sustainable use of renewable natural resources for approximately 60,000 persons

C CRITERIA APPLICABLE TO ECONOMIC SUPPORT FUNDS ONLY

1. **Economic and Political Stability** (FAA Sec. 531(a)). Will this assistance promote economic and political stability? — N/A

To the maximum extent feasible, is this assistance consistent with the policy directions, purposes, and programs of Part I of the FAA?

2 **Military Purposes** (FAA Sec. 531(e)): Will this assistance be used for military or paramilitary purposes?

3. **Commodity Grants/Separate Accounts** (FAA Sec 609): If commodities are to be granted so that sale proceeds will accrue to the recipient country, have Special Account (counterpart) arrangements been made? (For FY 1993, this provision is superseded by the separate account requirements of FY 1993 Appropriations Act Sec 571(a), see Sec 571(a)(5))

4. **Generation and Use of Local Currencies** (FAA Sec. 531(d))· Will ESF funds made available for commodity import programs or other program assistance be used to generate local currencies? If so, will at least 50 percent of such local currencies be available to support activities consistent with the objectives of FAA sections 103 through 106? (For FY 1993, this provision is superseded by the separate account requirements of FY 1993 Appropriations Act Sec. 571(a), see Sec. 571(a)(5))

5. **Cash Transfer Requirements** (FY 1993 Appropriations Act, Title II, under heading "Economic Support Fund," and Sec. 571(b)). If assistance is in the form of a cash transfer.

a **Separate account:** Are all such cash payments to be maintained by the country in a separate account and not to be commingled with any other funds?

b **Local currencies:** Will all local currencies that may be generated with funds provided as a cash transfer to such a country also be deposited in a special account, and has A I D. entered into an agreement with that government setting forth the amount of the local currencies to be generated, the terms and

conditions under which they are to be used, and the responsibilities of A.I.D and that government to monitor and account for deposits and disbursements?

c **U.S. Government use of local currencies:** Will all such local currencies also be made available to the U.S government as the U.S. determines necessary for the requirements of the U.S. Government, or to carry out development assistance (including DFA) or ESF purposes?

d. **Congressional notice:** Has Congress received prior notification providing in detail how the funds will be used, including the U S. interests that will be served by the assistance, and, as appropriate, the economic policy reforms that will be promoted by the cash transfer assistance?

6. **Capital Projects** (Jobs Through Exports Act of 1992, Sec. 306, FY 1993 Appropriations Act, Sec. 595): If assistance is being provided for a capital project, will the project be developmentally-sound and sustainable, i.e , one that is (a) environmentally sustainable, (b) within the financial capacity of the government or recipient to maintain from its own resources, and (c) responsive to a significant development priority initiated by the country to which assistance is being provided. (Please note the definition of "capital project" contained in section 595 of the FY 1993 Appropriations Act)

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