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UNITED STATES INTERNATIONAL DEVELOPMENT COOPERATION AGENCY
AGENCY FOR INTERNATIONAL DEVELOPMENT
Washington, D. C. 20523

LAC REGIONAL

PROJECT PAPER

ENVIRONMENT/GLOBAL CLIMATE CHANGE

AID/LAC/P-893

PROJECT NUMBER: 598-0784

UNCLASSIFIED

AGENCY FOR INTERNATIONAL DEVELOPMENT PROJECT DATA SHEET		1. TRANSACTION CODE <input type="checkbox"/> A = Add <input type="checkbox"/> C = Change <input type="checkbox"/> D = Delete	Amendment Number _____	DOCUMENT CODE 3
2. COUNTRY/ENTITY LAC Regional		3. PROJECT NUMBER 598-0784		
4. BUREAU/OFFICE LAC/DR <input type="checkbox"/> 05 <input type="checkbox"/>		5. PROJECT TITLE (maximum 40 characters) Environment Global Climate Change		
6. PROJECT ASSISTANCE COMPLETION DATE (PACD) MM DD YY 09 30 96		7. ESTIMATED DATE OF OBLIGATION (Under 'B', below, enter 1, 2, 3, or 4) A. Initial FY <input type="checkbox"/> 9 <input type="checkbox"/> 0 B. Quarter <input type="checkbox"/> 4 C. Final FY <input type="checkbox"/> 9 <input type="checkbox"/> 4		

8. COSTS (\$000 OR EQUIVALENT \$1 =)						
A. FUNDING SOURCE	FIRST FY 90			LIFE OF PROJECT		
	B. FX	C. L/C	D. TOTAL	E. FX	F. L/C	G. TOTAL
AID Appropriated Total						
(Grant)	(2,974)	()	(2,974)	(30,000)	()	(30,000)
(Loan)	()	()	()	()	()	()
Other 1.						
U.S. 2.						
Host Country						
Other Donor(s)						
TOTALS	2,974		2,974	30,000		30,000

9. SCHEDULE OF AID FUNDING (\$000)									
A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH CODE		D. OBLIGATION TO DATE		E. AMOUNT APPROVED THIS ACTION		F. LIFE OF PROJECT	
		1 Grant	2 Loan	1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan
(1) ARDN				7,508		17,492		25,000	
(2) PSEE				815		4,185		5,000	
(3)									
(4)									
TOTALS				8,323		21,677		30,000	

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)
 The purpose of the E/GCC Program is to assist in the development and adoption of policy reforms, technologies, and practices that will result in the sustainable and efficient use of forest and energy resources.

14. SCHEDULED EVALUATIONS	15. SOURCE/ORIGIN OF GOODS AND SERVICES
Interim MM YY MM YY Final MM YY 09 94 07 96	<input checked="" type="checkbox"/> 000 <input type="checkbox"/> 941 <input type="checkbox"/> Local <input type="checkbox"/> Other (specify)

16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a _____ page PP Amendment.)
 This authorization subsumes those activities authorized in FY 90, FY 91 and so far during FY 92.

17. APPROVED BY	Signature James H. Michel <i>James H. Michel</i>	18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION
	Title AA/LAC	

PROJECT AUTHORIZATION

Name of Country: LAC Regional
Name of Project: Environment/Global Climate Change Program
Number of Project: 598-0784

1. Pursuant to Sections 103 and 106 of the Foreign Assistance Act of 1961, as amended, I hereby authorize the Environment/Global Climate Change Program for the Latin America and the Caribbean Region involving planned obligations of not to exceed \$30 million* in grant funds over a five year period from the date of authorization, subject to the availability of funds in accordance with the A.I.D. OYB process, to help in financing foreign exchange and local currency costs for the program. The planned life of the project is six years from the date of initial obligation.

2. The purpose of the program is to assist in the development and adoption of policy reforms, technologies, and practices that will result in the sustainable and efficient use of forest and energy resources. The purpose will be accomplished through a number of interrelated activities selected using an overall set of guidelines. Activities will take place in Brazil, Mexico and Central American countries.

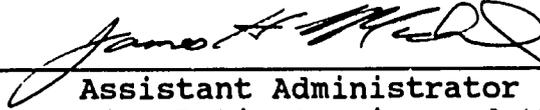
3. The Agreement(s) which may be negotiated and executed by the officer to whom such authority is delegated in accordance with A.I.D. regulations and Delegations of Authority shall be subject to the following essential terms and covenants and major conditions as A.I.D. may deem appropriate.

a. Source and Origin of Commodities, Nationality of Services: Commodities financed by A.I.D. under the program shall have as their source and origin the United States, except as A.I.D. may otherwise agree in writing. Except for ocean shipping, the suppliers of commodities or services shall have the United States as their place of nationality, except as A.I.D. may otherwise agree in writing. Local procurement, in accordance with the Agency's Buy America policies, is permitted.

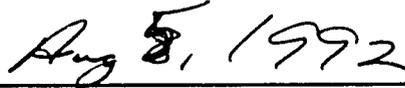
*\$30 million includes all previous authorizations under this project.

6

Ocean shipping financed by A.I.D. under the program shall, except as A.I.D. may otherwise agree in writing, be financed only on flag vessels of the United States.



Assistant Administrator
Bureau for Latin America and the Caribbean



Date



ENVIRONMENT/GLOBAL CLIMATE CHANGE (598-0784)
Project Paper

PROJECT DATA SHEET

DRAFT PROJECT AUTHORIZATION

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I. SUMMARY

A. Rationale and Description

The Environment and Global Climate Change Program (E/GCC) is a five year, approximate \$30 million effort of the Agency for International Development (A.I.D.)'s Latin America and Caribbean (LAC) Bureau. The Program responds to FY '90, '91, and '92 legislation directing the Agency to address the threat of global climate change in "key" developing countries. "Key" countries are those projected to contribute large amounts of greenhouse gases, especially CO₂. The emissions of greenhouse gases, produced mainly by the burning of forests and fossil fuels, is of concern because they trap heat in the earth's atmosphere. Current scientific models predict that consequent increases in temperature could have globally catastrophic effects.

Three "key" countries have been selected in the LAC region. Brazil and Mexico are the two primary countries, and their country-specific projects under E/GCC will receive most of the Program's funding. The Central American countries, considered collectively, are the third. Central America was selected in part because of the opportunity the region provides for developing a model of international cooperation in solving environment and natural resource (E/NR) management problems. As such, E/GCC activities in Central America are a part of the program's larger "Special Activities" project, designed to provide flexibility in responding to both exceptional opportunities and Congressional Mandates for addressing GCC issues outside of "key" countries.

Reducing greenhouse gas emissions will require the substantial efforts of many countries over many years. In the context of the multinational effort required, E/GCC's goal is to help reduce greenhouse gas emissions in the LAC region. This goal is consistent with the development objectives of the Program's host countries, and with agency-wide and LAC Bureau policies and strategies. E/GCC's purpose is to assist in the development and adoption of policy reforms, technologies, and practices that will result in the sustainable and efficient use of forest and energy resources. While directly reducing greenhouse gas emissions significantly is beyond the financial resources and time frame of E/GCC, the Program's strategy is to develop pilot demonstration activities and promote policy reforms and host-country capabilities, so that the policies and technologies being fostered by E/GCC can be disseminated and have a significant impact beyond the specific sites, institutions, and communities with which the Program is directly working.

E/GCC will focus primarily on the sustainable use of forest resources because the burning of tropical forests for conversion to agricultural lands is the primary source of gases in the

region, and because forest resource management is the sector in which A.I.D. believes it can have the greatest impact. Ironic about the forests' destruction is that soil and climate characteristics make much of the land cleared unsuitable for agriculture. The soil is exhausted in a few years, and lost with the forest is the economic potential of many forest-based industries. Consequently, E/GCC's primary objective is promoting economically superior land-use alternatives that rely on the sustainable use of forest resources. Only if such alternatives are available, will there be the economic incentive necessary for people to conserve rather than destroy their forests.

Several different alternatives to clearing forest are being promoted. E/GCC is supporting research and pilot demonstration activities for new non-timber products, and for improving the cultivation and processing of traditional ones such as brazil nuts and rubber. Increasing market demand and the local producers' share of profits are also being addressed. To reduce the pressure for clearing new lands, E/GCC is supporting research to improve agroforestry techniques, restore degraded lands, and develop community based micro-enterprises that are both compatible with the conservation of forests and economically beneficial. Many of E/GCC's activities take place in or near protected areas such as extractive reserves and national parks. E/GCC is providing support for the establishment and management of these areas.

Two approaches are being taken to address policy and regulatory issues. E/GCC places an emphasis on local community management of natural resources in the belief that it is at this level that many of the decisions affecting forest use are made. Legal and economic policy expertise will be provided to communities at E/GCC activity sites for identifying incentives that promote the destruction of forests, and for developing and implementing reforms. Inevitably this approach, while starting locally, leads to state and federal policy and implementation issues. So, concurrently E/GCC will work at the state and national levels to educate authorities about policy implications for the sustainable use of forests.

E/GCC's secondary focus is reducing the burning of fossil fuels by promoting alternative energy sources and improving efficiency in electric power generation and use. Technologies to improve efficiency and promote alternative energy sources will be transferred, and pilot activities demonstrating the economic as well as environmental benefits of both will be conducted. Policy analyses and reforms, particularly in the areas of energy pricing and private participation in electricity generation, will be promoted.

Most E/GCC activities will be executed through grants and cooperative agreements to U.S. NGOs working primarily with host

country NGOs and local communities to implement program activities. E/GCC is also funding other U.S. government agencies' activities (principally those of the EPA and the USDA/FS) that support E/GCC objectives, and some assistance will be provided directly to host government agencies.

The experience that host country institutions have, under guidance of U.S. NGOs and agencies, in developing and implementing activities will increase the host country's abilities to continue these efforts once E/GCC support ends. Strengthening through experience will be complimented with direct assistance and training in management, strategic planning, fund raising, and other organizational skills. Furthermore, E/GCC will support increased communication within and among the NGO community, the researcher community, and governments so that sustainable-use practices can be rapidly developed and disseminated, and so the voice of people concerned about forest conservation will have greater influence on policies and regulations.

Monitoring and evaluation (M&E) is an important element of the Program. The Brazil, Mexico, and Special Activities Projects will have separate M&E components that feed into an overall AID/W evaluation plan. M&E has been designed to provide ongoing feedback so that an iterative process of adjustments to Program activities can be made. Key country and overall Program evaluation reports will also be produced.

B. Summary Budget

Environment/Global Climate Change
Summary Budget

	FY '90	FY '91	FY '92	FY '93	FY '94	Total
<u>Mexico Project</u>						
FOREST MANAGEMENT	850,000	1,824,000	1,223,150	2,186,500	1,988,500	8,072,150
POLICIES/INSTITUTIONS	99,330	200,000	386,850	300,000	200,000	1,186,180
ENERGY		433,000	250,000	500,000	400,000	1,583,000
OPERATIONAL SUPPORT	670	115,000	140,000	130,000	200,000	585,670
Total	950,000	2,572,000	2,000,000	3,116,500	2,788,500	11,427,000
<u>Brazil Project</u>						
SUSTAINABLE USE	1,003,640	1,866,000	1,850,000	2,035,000	2,135,000	8,889,640
POLICY/ECONOMICS	100,000	459,188	490,000	600,000	650,000	2,299,188
OPERATIONAL SUPPORT	100,000	84,000	180,000	175,000	180,000	719,000
Total	1,203,640	2,409,188	2,520,000	2,810,000	2,965,000	11,907,828
<u>Special Activities & AID/W</u>						
SPECIAL ACTIVITIES	646,330	981,000	3,500,000	500,000		5,627,330
M & E			200,000	200,000	400,000	800,000
Total	646,330	981,000	3,700,000	700,000	400,000	6,427,330
<u>E/GCC Total</u>	2,799,970	5,962,188	8,220,000	6,626,500	6,153,500	29,762,158

II. RATIONALE

A. PERCEIVED PROBLEM

Developing countries, as they expand economic activities to meet the needs and improve the standard-of-living of their rapidly growing populations, are projected to dramatically increase their emissions of greenhouse gases. This causes concern because greenhouse gases trap heat in the earth's atmosphere which current scientific models predict could result in temperature increases significant enough to have globally catastrophic effects. Potential events include warming and thus expansion of ocean waters resulting in the flooding of coastal cities, and the shifting of weather patterns with consequent worldwide disruption of agricultural and forestry production.

Emission of greenhouse gases by Latin American and Caribbean countries is projected to increase dramatically if alternatives to current practices are not developed and implemented. The causes need to be evaluated on a country-by-country basis, but deforestation and energy use are the two principle sources of greenhouse gases in the region to which E/GCC is addressing itself.

1. Deforestation

Rates of deforestation in the region are alarming. In Brazil during the 1980's over 9 million hectares of forest (mostly in the Amazon) were cleared and burned per year, producing an estimated 160 to 300 or more billion metric tons of CO₂, or 5-10% per annum of the world's total CO₂ emissions. In Mexico 700,000 hectares a year are cleared and in Central America 470,000. If rates of deforestation continue, most of the region's remaining forests will be destroyed by the first part of the next century.

In addition to GCC concerns, deforestation generates a wide range of E/NR, and consequently social and economic problems. Agricultural expansion is the main cause of deforestation. Ironically, because of soil and climate characteristics, much of the land cleared can not sustain long term agriculture, which exhausts the soil in a few years. Opportunities for future prosperity are reduced through the loss of soil fertility, soil erosion, siltation of hydro-electric facilities (e.g., the lost revenue to date due to siltation at one site, the Cachi Dam in Costa Rica, is estimated to be at least \$133 million); through the loss of forest-based industries involving such things as timber, tourism, and extractive products; and through the

destruction of habitats containing some of the world's richest biological diversity.

2. Energy

Burning fossil fuels directly produces greenhouse gases. In 1987 the burning of coal, gas, and oil produced an estimated 23 million metric tons of CO₂ in Brazil, and 35 million metric tons in Mexico. Hydro-electric power, which supplies 69% of the region's electricity and is supposedly "clean," contributes indirectly. The dams of hydroelectric facilities flood large expanses of forests, especially in the flat Amazon Basin, destroying these forests and their capability to absorb and hold greenhouse gases. Under the anaerobic conditions of the flooded forests, plant material breaks down releasing large quantities of methane, a gas twenty to thirty times more effective than CO₂ in trapping heat. The single most effective way of reducing energy-related greenhouse gas emissions is to increase energy efficiency. Improved energy efficiency would also positively effect the region's economies, since a substantial proportion of the region's foreign debt is due to loans for meeting energy demands. Alternative sources of energy can also be effective.

3. Causes and Constraints

Rapidly growing populations are the driving force behind the increase of greenhouse gas emissions in LAC countries. The LAC region's poor majority have few other economic alternatives than living off the land. The traditional economic structure of most of the countries is characterized by highly skewed land tenure and wealth distribution patterns in which access to the most productive land is limited to the wealthy elite. This assures that population pressures will force the clearing of forest lands marginal for agriculture and susceptible to degradation. Political and economic policies that focus on short term goals assure that individuals and enterprises will maximize their profits rather than build for sustainable growth. Inadequate infrastructure to support extension, education, credit, inputs, and markets assures that the technology, farming and timber systems, extractive industries, etc. that might allow for the sustainable use of forest resources are not developed or not widely disseminated.

Many of the causes and constraints given above also apply to promoting energy efficiency and alternative energy sources. The demand of growing populations is threatening to outstrip generating capacity. Inadequate infrastructure, capital, and managerial and technical capabilities impede progress. Compounding this are energy pricing and production policies that exclude the private sector and encourage inefficiency.

B. Congressional Mandate

To address developing countries' projected increase of greenhouse gas emissions, Congress in FY '90 directed A.I.D. to begin a "Global Climate Change initiative." The FY '90 Legislation instructed A.I.D. to work in "key" developing countries, defined as those projected to contribute large amounts of greenhouse gases, especially CO₂. The legislation also contained notwithstanding language allowing countries to be included in the Initiative previously restricted from receiving A.I.D. funds.

Congress directed the Initiative's focus to be on deforestation and industrial, especially energy related, sources of greenhouse gases. As part of the Initiative, A.I.D. is to pursue strategies to, "accelerate sustainable development in areas such as reforestation, biodiversity, end-use energy efficiency, least-cost energy planning, and renewable energy;" and is to increase the number and expertise of its staff in these areas. Congress instructed A.I.D. to obligate \$15 million in FY '90 for the Initiative, of which \$3 million was designated by an Agency-wide committee to be the LAC Bureau's share. For FY '91 and '92, \$30 million was earmarked each year of which \$6 million per year is LAC's share. Future earmarks are expected.

E/GCC is the LAC Bureau's response to the Congressional mandate. It was designed as a five-year \$30 million program -- \$3 million the first year, \$6 million for FY '91, '93, and '94, and \$9 million for FY '92. Three "key" countries have thus far been selected in the LAC region. Others may be designated during program development and implementation. Brazil and Mexico are the two primary "key" countries and will receive most of the E/GCC funding. The Central American countries, considered collectively, are the third, and were selected in part because of the opportunity for developing a model of international cooperation in solving E/NR problems. In addition to the "key" countries, E/GCC has a "Special Activities" component designed to respond both to uniquely significant opportunities and to Congressional Mandates and USG commitments for GCC activities outside of "key" countries.

To meet the Congressional directive, the LAC Bureau obligated funds in FY '90 and '91 to begin a GCC initiative in the LAC region. This PP states the unifying framework of ongoing activities, and provides the structure for planning future activities.

C. Conformity with USG, Agency, and Bureau Policies

1. Context of Broader USG Concerns

The GCC legislation is a recent addition to a series of laws expressing broad Congressional concern about the effects of current development practices not only on developing countries' but the world's natural resource base. Sections 117, 118, and 119 of the Foreign Assistance Act instruct A.I.D. to work in the areas of environment, tropical forestry, and biodiversity. A.I.D. has also been authorized to finance "private" debt for nature swaps; and under the Enterprise for the Americas Initiative, the use of local-currency interest payments on restructured U.S. Government (public) debt is authorized for in-country environmental projects. In addition, there have been several Congressional earmarks for the conservation of biological diversity including the LAC Parks-in-Peril program and the Conservation of Neo-tropical Birds project. The U.S. Government has also made a \$ 20 million commitment to support the G-7's Brazil Rainforest Pilot Program. Approximately \$11.5 million of the commitment is being met through ongoing and future E/GCC program in Brazil. An additional \$3 million are being provided using E/GCC as a transfer vehicle to the G-7 Program's Core fund.

2. Agency and Bureau Policies

The E/GCC Program supports fundamental Agency and Bureau policies. A.I.D.'s "Mission Statement" identifies "responsible environmental policies and prudent management of natural resources" as a principle guide to the development and implementation of the Agency's programs. Elaborating on this principle, the "Environment and Natural Resources Policy Paper" states that the Agency's central objective is, "... to promote environmentally sound, long-term economic growth by assisting developing countries to conserve and protect the environment and manage their exploited resources for sustainable yields." The recently approved Agency Environmental Strategy Framework reconfirms A.I.D.'s commitment to promoting environmentally sound development, and identifies GCC as a central issue. "Encouraging the preservation and sustainable use of the natural resource base," is also one of the fundamental LAC Bureau objectives.

Conformity with the strategies of the USAIDs in the "key" countries (see USAID/Brazil and USAID/Mexico GCC strategy documents which are on file in LAC/DR/E) was the predominant consideration in the development of E/GCC's FY '90 and '91 activities, and is further discussed in Section III below, where "key" country activities are described.

3. Coordination and Collaboration

Addressing GCC issues will require the resources and efforts of many nations. Fortunately, GCC and related E/NR issues are rapidly attracting international attention and funds to the LAC region. It is essential that E/GCC activities be premised on an approach that is collaborative and complementary to the efforts of not only other A.I.D. Bureaus and other U.S. agencies, but with the many donors, banks, and NGOs addressing E/NR issues in the region.

(a) A.I.D. Bureaus and U.S. Agencies --

To maximize the impact of U.S. dollars and to assure that the U.S. is speaking with one voice on the important issue of GCC, extensive and ongoing efforts have been made to coordinate and collaborate with other Bureaus of A.I.D. and other U.S. agencies. Many E/GCC activities have been developed in collaboration with A.I.D.'s Bureau for Research and Development and Bureau for Private Enterprise. This coordination will continue. Other agencies with which the development and implementation of E/GCC is being coordinated include the State Department, USDA/Forest Service, the Environmental Protection Agency, Treasury, and the Department of Energy. Agencies with smaller programs that may in the future receive E/GCC funding include the Fish and Wildlife Service, the Park Service, and the Peace Corp.

(b) Other Donors and the Multilateral Banks --

There are several other donors and the World Bank addressing Global Climate Change and related issues in Brazil and Mexico. To be most effective, E/GCC must be developed and implemented in coordination with these other institutions' activities. For the Brazil E/GCC component, the coordination and monitoring framework being developed by the World Bank managers of the G-7 Brazil Rainforest Pilot Program should be helpful.

In Mexico the World Bank has recently approved a \$50 million loan for the strengthening of the Subsecretaria de Ecologia of SEDUE. These funds are in addition to a GEF grant of \$30 million for strengthening SEDUE's capacity to manage declared parks and reserves. Both activities could overlap or even conflict with E/GCC activities. Exchanges of information and meetings between A.I.D. and the World Bank have taken place to try and avoid difficulties and make the programs reinforcing. Continued frequent communication both in Washington and the field is essential.

D. Conformity with Host Country Policies

1. Brazil

The notwithstanding language in the FY '90 Congressional legislation allowing for A.I.D. GCC activities with Brazil, coincides with a sharp turn-about in Brazilian policies, placing E/NR management problems at the top of that country's agenda. The Government of Brazil (GOB) has taken steps to reduce economic and policy incentives that promote deforestation. The GOB has also enacted a range of laws and measures regulating E/NR threatening activities such as mining, timber extraction, and forest clearing for agriculture and ranching. Large tracts of land have been set aside as "extractive" reserves (e.g., areas reserved for the sustainable extraction of mostly non-timber commercial forest products), and regulations have been issued requiring large timber companies to practice sustainable forestry. Brazil has asked the international community for assistance in addressing its E/NR management problems.

2. Mexico

The negative consequences of the excessive generation of greenhouse gases and contaminants are a daily topic of Mexican press and television, and there are numerous indications of the increased commitment of the Government of Mexico (GOM) to E/NR management. These include the 1988 passage of the Environmental Protection Law (Ley General del Equilibrio Ecologico y Proteccion al Ambiente), and the GOM's closer collaboration with international and indigenous conservation NGOs. More recently, Mexican President Carlos Salinas de Gortari stated in his "State of the Nation" address given on November 1, 1990, that "Development is taking place (in Mexico) within a process of growing respect for the environment. While continuing to work on priority development needs, (Mexican) society is establishing a new relationship with its natural surroundings." The environmental issues surrounding the pending North America Free Trade Agreement have also increased Mexico's awareness and interest in addressing environmental issues related to development.

3. Central America

Public concern about environmental degradation and its economic impacts has been growing in Central America. As a consequence, the Presidents of Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua established the Central American Commission on Environment and Development (CCAD). The Presidents formed the CCAD in recognition of the need for regional cooperation to promote the wise use of natural resources

and the control of pollution. Potential priority areas set forth in CCAD's charter are environmental training and education, protection of watersheds and related ecosystems, management of tropical forests, and pollution control. A CCAD objective is obtaining the financial support necessary for achieving environmentally sound development.

III. Program Description

A. Goal, Purpose, and EOPS

1. Goal

The E/GCC program's goal is to help reduce greenhouse gas emissions in the LAC region.

2. Purpose

The program's purpose is to assist in the development and adoption of policy reforms, technologies, and practices that will result in the sustainable and efficient use of forest and energy resources.

3. End of Project Status

The purpose will be accomplished through a number of interrelated activities. Pilot activities will be conducted that develop/demonstrate the sustainable use of forest resources, and the more efficient use of energy and the use of alternatives to fossil fuels. These results will be disseminated to potential users for broader adoption, and to policy makers to increase awareness of economically viable alternatives to current wasteful practices. Studies will be conducted for analyzing both management and economic policies related to E/NR issues, and NGOs as well as government agencies will be strengthened through training for facilitating the development and implementation of policy reforms.

At the end of the program: (1) selected NGOs and host government agencies concerned with and responsible for the sustainable and efficient use of forest and energy resources will be strengthened and communication among them enhanced, leading to better coordination and support for each other's efforts; (2) pilot activities will be completed that address critical social and technical issues involving the sustainable and efficient use of forests and energy; (3) policies will be analyzed and alternatives developed for increasing the sustainable and efficient use of forest and energy resources; (4) policy makers' and the public's awareness will be increased through seminars, workshops, and outreach activities that communicate the costs of current practices and policies, and the availability of

alternatives; and (5) a monitoring and evaluation component will be established to measure E/GCC's impact.

B. CRITERIA FOR SELECTING ACTIVITIES

E/GCC has an overall set of guidelines for the selection of program activities. Within this framework the Brazil, Mexico, and Special Activities/Central America projects have derived individual approaches tailored to the particular circumstances each is addressing. These approaches are described in the sections below for each component. The Program guidelines common to all components are as follows:

1. "No Regrets Policy" -- E/GCC activities will be carried out within the framework of the United States' "no regrets policy." This policy states that: The U.S. will act now to address the threat of GCC, and not wait for indisputable evidence of the certainty and dimensions of the threat. To wait would eliminate the opportunity for taking effective remedial action. But, given the uncertainties about the true threat of GCC, only activities yielding the dual benefits of both improved E/NR management and GCC mitigation will be funded.

2. Emphasis on U.S. Predominant Capabilities -- These strengths include the ability to work directly with NGOs and the private sector which the Multilateral Development Banks cannot, and the U.S.'s extensive technological abilities which are respected in the region. Focusing on U.S. strengths in the E/GCC program is essential because the funds available for the program are modest compared to those being provided by other donor and lending agencies such as the World Bank, the Inter-American Development Bank, and the GEF which have hundred-million dollar projects addressing broader environment, natural resource management, and energy issues in the region.

3. Existing Host Country Capabilities -- Funding will primarily be to individuals and institutions with existing high capabilities for which modest amounts of money can have a catalytic effect on their programs and efforts. The available U.S. funds are not adequate for starting large new organizations "de novo."

4. Emphasis on Deforestation and Energy -- The program's primary focus is on addressing deforestation. The cutting and burning of forests is the greatest greenhouse gas generating activity in the region and is the sector in which A.I.D. believes it can have the greatest impact. There are serious urban-based environmental and energy problems that release significant amounts of greenhouse

gases, but these problems to a great extent require capital intensive solutions and are the focus of other donors with greater resources than A.I.D. has under the GCC initiative. A small component of E/GCC, however, will promote energy efficiency and renewable energy technologies through training, technology transfer, institutional strengthening, studies, and policy reviews -- areas in which the Agency believes it can have a significant impact with limited funds.

5. Leveraging non-A.I.D. funds -- An emphasis will be placed on leveraging funds through such mechanisms as matching grants with NGOs and debt-for-nature swaps.

C. BRAZIL PROJECT

1. Rationale and Strategy

The extensive clearing and burning of trees in the Amazon is by far the largest producer of greenhouse gases in the country. The global warming potential of gases released from deforestation (principally in the Amazon Basin) in 1989 was estimated to be 4.5 times greater than all other sources combined in the country (World Resources Institute). Accordingly, Brazil E/GCC activities will focus on promoting economically viable alternatives to the slash-and-burn agriculture and ranching practices currently deforesting the Amazon.

Activities have been identified at the national, regional (Amazon), and local levels, and will be instituted through a combination of public agencies and NGOs. Many critical studies need to be done on the problem of deforestation in the Amazon. However, a substantial amount of research exists, much of which has not been disseminated. Consequently, while support will be provided for some of the needed studies, an emphasis will also be placed on increasing communication among researchers for the exchange of ideas; between the research community and local people, so that findings can have practical applications; and between the research community and decision makers, so that informed policy decisions can be made that will promote more economically beneficial alternatives to current wasteful uses of forest and energy resources.

2. Project Elements and Ongoing Activities

A.I.D.'s GCC initiative in Brazil was developed in close collaboration with the Research and Development Bureau (R&D) Bureau, which provided funding for a number of activities. The Private Enterprise Bureau also provided a loan for an activity. Activities in the initiative fall into three categories: (1) Sustainable Use of Amazonian Forest Resources; (2) Economic/

Environmental Policy Analysis and Institution Building for Planning and Management; and (3) Project Development and Implementation Support. Continued funding is expected particularly from R&D for both ongoing and new activities, and coordination among the Bureaus will be required throughout the life of the program. Program activities in FY '90 & '91 were implemented through matching grants to NGOs and Universities, and through PSCs. An annex describes ongoing activities. Described below are the four sub-components.

(a) Sustainable Use of Amazonian Resources

Deforestation in the Amazon can only be halted if sustainable and economically viable alternatives are developed and widely implemented. E/GCC Brazil project will promote alternative-sustainable uses in three areas: extractive reserves, agroforestry/sustainable agriculture, and forestry.

i. Extractive Reserves

Extractive industries depend on the forest remaining intact for the sustainable harvesting of such products as chicle, brazil nuts, rubber, palm fronds (for the florist industry), etc. The E/GCC Brazil project, through a grant to the World Wildlife Fund (WWF), began work in the State of Amapa with grassroots NGOs to initiate community organization, land tenure studies, and forest resource assessments -- necessary precursors to large-scale establishment of extractive reserves in the region. The Environmental Law Institute (ELI) is working with WWF to identify and address legal and policy issues involved with the establishment and management of the Amapa reserves. Complementing these efforts is a loan by PRE to Cultural Survival Enterprises which is: (1) assisting local people in the development of non-timber forest products; (2) creating international markets for these products; and (3) acting as a conduit between international customers and indigenous producers. Another product dependent on large expanses of intact forest is ecotourism. Tourism based on tropical wilderness and wildlife is rapidly growing. E/GCC has provided funds and expects to provide additional support to WWF for work with a local NGO in the State of Amazonas to develop tourism in the area. Future funding is also expected for capitalizing on WWF's and ELI's preliminary work in Amapa on establishing extractive reserves; for making available the technology and market development resulting from the A/PRE loan; and for further research on the economics of extractive industries, product development, and marketing.

ii. Agroforestry/Sustainable Agriculture

Current agricultural practices exhaust most cleared land in the Amazon within a few years. As a consequence additional forests need to be continually cleared. The Brazil project will develop and disseminate sustainable agricultural practices through a grant to the University of Florida at Gainesville. UFG will assist a consortium of institutions, PESACRE, to carry out a three-year program of substantive research and extension activities. The program seeks to develop and implement alternatives for diversifying small-scale agriculture and agroforestry production systems in sustainable ways in order to: contribute to higher levels of income and improved quality of life for rubber tappers, agriculturalists, and Indians; permit stable settlement patterns for rural populations; reduce the negative environmental impact of production activities; reduce social pressures in urban centers; and strengthen the technical and institutional basis for the formulation of agrarian policies that can reduce pressures for deforestation in the State of Acre. Another approach is restoring the agricultural productivity of degraded land. Research on this is being done through an R&D grant to the Woods Hole Research Center and an E/GCC grant to WWF. E/GCC plans to provide funds to build upon and disseminate the findings of the grants to UFG, Woods Hole, and WWF.

iii. Forestry

Timber harvesting in the Amazon is essentially a predatory process carried out by private companies seeking short-term profits. Recent regulatory requirements for sustainable forestry provide an opportunity to link research and forest managers to develop exemplary forest management systems. Through an FY '90 and '91 R&D grant, WWF in the municipality of Paragominas will: (1) conduct cost benefit analyses of ongoing forest management efforts; (2) evaluate existing forestry policies; and (3) conduct a pilot forest management project with a logging company. E/GCC in collaboration with R&D will build upon these activities and expand them to other parts of the Amazon. An interagency agreement with the U.S. Department of Agriculture's Forest Service is focusing on strengthening IBAMA's forest management abilities.

(b) Environmental Policies, Planning, and Management

Inappropriate or short-sighted policies often encourage the inefficient and destructive use of the environment and natural resource base, or, if appropriate policies are in place, they are frequently ineffectively implemented. E/GCC in Brazil will promote the development of environmentally sound policies and will strengthen the NGOs and government agencies responsible for

the planning and management involved in policy implementation. In pursuing these objectives, E/GCC will be active in three areas: (1) Natural Resource and Energy related Policy analysis, (2) Strengthening and Coordination of Government Agencies and NGOs, and (3) Improving Environmental Assessment Capabilities.

i. Natural Resource Policies and Economics

E/GCC has provided WWF with funds to work with Brazilians in designing and implementing a workshop for the civil servants responsible for addressing natural resource economic issues in Brazil's 35 federal agencies. Also supported are economic and policy studies conducted jointly by Brazilian and leading international E/NR economists. The findings of these studies will be presented at seminars to which leading Brazilian economists and policy makers will be invited. Future funding shall support an inventory of current energy, forestry, extractive reserve, agricultural, ranching, etc. policies and their current implementation. This inventory will be used as baseline information to measure changes that Brazil is making to address GCC issues. The inventory will also establish a priority list for identifying policies that should be focused on for future study and reform. Funding will also be provided to bring Brazilians to the U.S. for training, and to support meetings that will bring leading international E/NR economists and managers together with influential Brazilian counterparts, for an examination of the effects of economic and management policies on the potential for sustainable development.

ii. Institutional Strengthening

NGOs play a key role in raising public awareness and establishing a political environment wherein environmental considerations become a key component of government decision making. The potential of Amazon-based NGOs to work with government research agencies, carry out demonstration field projects, and play a positive role in the policy process, has been limited by their low level of funding, planning, and training. E/GCC will provide training, assistance in management, and basic infrastructure needs to help some Amazonian NGOs become more effective. Funds will also be made available to the upper management of Brazil's national environmental agency, the Special Environment Secretariat (SEMA), and its implementing arm, the Brazilian Institute for Environment and Renewable Natural Resources (IBAMA), to support planning and policy development. Activities will include: (1) consultations with a wide range of technical experts and interest groups on policy issues; and (2) strategic planning for the agencies to become more capable of effectively managing large-scale funding from other bilateral and multilateral donors.

iii. Environmental Assessment Capabilities.

E/GCC has provided grants to WWF, ELI, USDA/FS, and the U.S. Environmental Protection Agency to bring technical experts and the government environmental regulatory agency together in the state of Acre and the state of Para to develop technical guidelines for preparation and evaluation of environmental assessments for forest exploitation or forest clearing activities. This work will be linked to environmental education and dispute resolution activities in order to promote active public participation in environmental decision making. Future funding will expand this activity and possibly involve other states of Brazil and the Federal Government.

(c) Operational Support

The proposed E/GCC activities for Brazil represent a substantial increase in the work load for the A.I.D. Representative. To assist the Representative in the development and management of the Brazil project two PSC Global Climate Change Advisor will be stationed at the mission throughout the duration of the project. In addition funds will be needed on an ad hoc basis for the design and fine tuning of project strategy.

3. End of Project Status

At its end the E/GCC program will have contributed to reducing the rate of deforestation in the Brazilian Amazon. Outputs toward achieving this objective will be:

(1) Environmentally viable alternatives to deforestation identified and promoted -- (a) Improved systems for natural forest management identified and promoted (model plans for protected areas, extractive reserves, and buffer zones developed; and new forest products, processing techniques, and markets developed); (b) Systems which stabilize shifting cultivation identified and promoted (support for applied farming-systems-research on stable agroforestry systems, disseminate information on alternatives to fire in agriculture); (c) Systems which make degraded lands more productive identified and promoted (explore market driven models for mixed forestry systems);

(2) Policies supporting environmentally-sound use of forests established and implemented -- (a) Implementation of the Environmental Impact Assessment (EIA) process supported at both the national and local level (NGOs trained to participate in the EIA process, and staff of state agencies trained in EIA preparation and evaluation; two state governments (Para and Acre) assisted in identifying EIA criteria); (b) Timber-policy review

process started and informed (results of applied research provided on viable timber-management models found in Brazil and other countries); (c) Development policies reviewed from environmental perspective (Brazilian researchers and government officials trained in environmental sciences, workshops held on natural resource economics and key policy issues, develop proposals developed for improved legal basis of extractive reserves); and

(3) An environmental constituency established in local communities with an appreciation for relevant gender issues -- (a) local institutions made more effective (training provided, networking supported, pilot projects implemented); and (b) local society made more environmentally aware (formal and informal education provided).

D. MEXICO

1. Rationale and Strategy

Mexico, the third largest country in Latin America, is endowed with a rich and diverse resource base, yet is faced by a long and complex list of environmental problems. The variety, complexity, and magnitude of the problems contrasted to the limited resources available under E/GCC require, as with Brazil, that the program focus its resources on a few critical geographical areas and objectives. With this constraint in mind, the Mexico E/GCC project will have as a primary sub-component, the Management of Tropical Forests, targeting the tropical and sub-tropical environments of southern Mexico. A second sub-component will address energy issues related to GCC. A third sub-component will promote Policy Formulation, Institutional Strengthening, and Increased Awareness for improving environmental, energy, and natural resource management related to GCC.

The primary focus of the Mexico E/GCC component was selected for several reasons. By concentrating its technical interventions in the area of forest management, E/GCC will be fulfilling Congressional mandates for both global climate change and for the protection of tropical forests and biological diversity. Mexico does have serious energy and urban environmental problems that affect GCC. These sectors, however, have become a focus of numerous other bilateral (including the U.S. through the Department of Energy and the Environmental Protection Agency) and multilateral donors, as well as the Mexican government. This donor support, added to the capital intensive nature of the sector, makes it less appropriate for technical interventions by E/GCC.

2. Project Elements and Ongoing Activities

i. Management of Tropical Forests

Activities under this sub-component will support ongoing programs to consolidate and manage legally declared protected areas and their buffer zones in the tropical and subtropical regions of southern Mexico. The focus will be on 8 reserves: Calakmul, Sian Ka'an, El Ocote, El Triunfo, Ria Celestun, Ria Lagartos, Montes Azules, and the Chimalapas. Together these reserves contain more than ten million acres of tropical forest, as well as unique biological and archaeological diversity. The management approach most frequently promoted will be that of the "biosphere reserve," in which a core preserve, such as a national park, is surrounded by a multiple-use buffer zone where economic activities compatible with conserving the core are practiced.

The immediate challenges lie in (1) creating partnerships with local communities; (2) identifying alternative production technologies for buffer zones that are sustainable, and that provide significant economic benefit to local inhabitants; and (3) consolidating the protection effort for the core areas. The techniques of integrating conservation and protected-areas management with development are rapidly evolving in Mexico. In addition, valuable information can be gained from projects such as Boscosa and Foresta in Costa Rica, and the MAYAREMA Project in Guatemala, which are also developing buffer zone and forest management techniques. Where appropriate, lessons learned will be shared and joint activities in reserve planning and management will be developed both among different reserves in Mexico, and between different projects in Central America.

Actions that will be taken under this sub-component include:

(i) Operational support (equipment, supplies, basic studies, inventories, technical assistance, training) for the development of management plans of protected areas and their buffer zones;

(ii) Socio-economic surveys and basic studies oriented toward buffer zone management and the development of alternative technologies in support of conservation;

(iii) Training and environmental education for local inhabitants;

(iv) Workshops, technical assistance, and pilot projects to further buffer zone management objectives and promote technology transfer/adoption by the local people;

(v) Collaboration with USAIDs and ROCAP on such activities as archaeological surveying and mapping in the Peten-

Calakmul region, joint workshops to exchange information on Biosphere planning and management experience, sustainable tropical forest management, ecotourism, etc.;

(vi) Establishment through debt-for-nature swaps of endowments for reserve management will be explored.

Initial funding of \$850,000 in FY '90 and \$1,824,000 in FY '91 was provided in support of these activities through three separate grants to local NGOs, and through buy-ins to the R&D Conservation of Biological Diversity Project and the LAC Regional Parks-in-Peril Project.

ii. Energy

The burning of fossil fuels for generating electricity is a major source of GCC gases in Mexico, and the country's demand for electricity is projected to grow by 6.5 percent per year through 1998. Resources A.I.D. has available for addressing these energy issues are small relative to other sources. The total 1991-92 investment planned for electrical expansion in Mexico is \$7.1 billion. This is being secured from Mexican sources as well as the World Bank, the Inter-American Development Bank, and the ExImbank of Japan.

Despite A.I.D.'s relatively small resources, E/GCC can make a contribution through supporting technology transfers involving training, workshops, and other interventions. In FY '91 \$433,000 of E/GCC funds matched by R&D/EI funds were obligated for promoting the integration of least-cost or integrated resource planning methodologies into Mexico's energy planning. These methodologies incorporate into the planning process: (1) environmental factors; (2) innovative, and recently commercialized technologies (including renewable energy); (3) efficiency improvements that serve as options to major investments in energy production; and (4) the purchase of power from independent, non-utility generators.

Future funding is expected for energy efficiency and renewable/alternative energy activities.

iii. Policy Formulation, Institutional Strengthening, and Human Resource Development

In order to effectively address GCC issues in Mexico, improvements in key policy areas and increased institutional and human resource capabilities will be required. Broad policy reform entails massive efforts on many fronts. Such an undertaking is beyond the resources of the Mexico E/GCC project. If done in collaboration with others and if focussed on a few

issues, however, E/GCC can contribute to policy change through such mechanisms as training, workshops, seminars, and policy analyses.

Already supported through FY '90 and '91 grants to Fundacion Universo Veintiuno (FUV) are efforts to improve environmental planning and management capabilities. Activities under the grant include: (1) the development of technical ecological norms to help control the emission of greenhouse gases; (2) the provision of technical assistance and training to promote municipal environmental planning and management; and (3) a workshop to develop a research agenda and methodologies related to global climate change in tropical Mexico.

Activities being considered for future funding under this sub-component include: an inventory of current energy, forestry, extractive reserves, agriculture, and ranching policies, and their implementation for greenhouse gas emissions; additional support to FUV for environmental management and planning related to GCC; a regional workshop or seminar on debt-for-nature swaps; a regional symposium on global warming that would analyze the nature of the problems and the means for reducing its threat; support to Centro de Ecologia to strengthen its Geographic Information System and related E/NR information management capabilities; Bachelors and Masters level training in energy, forest management, and other GCC related disciplines; and training, workshops, and policy analyses that will promote a reduction in energy related greenhouse gas emissions.

iv. Operational Support

As is the case for USAID/Brazil, the proposed Mexico E/GCC component represent a substantial increase in project responsibilities for the A.I.D. Representative. To assist the Representative, two Global Climate Change Advisor and potentially other assistance will be provided during the project.

3. End of Project Status

At its end the E/GCC program in Mexico will have contributed the reduction of greenhouse gas emissions in Mexico. The key outputs in the protection of threatened parks and reserves will include:

(1) Specific improvements in park management (park management plans in place; park boundaries demarcated; technical staff, including rangers trained and equipped);

(2) Improved economic/financial sustainability of conservation activities (increased GOM financial support for park

management; increased number of environmentally sound income-generating projects in buffer zones);

(3) Strengthened capacity of conservation NGOs (NGO/GOM cooperation in area-management formalized; key NGO/GOM staff trained); and

(4) An improved data/information base on status of protected area (baseline studies; GIS database; deforestation/land use monitoring).

The key outputs of A.I.D.'s far more modest investment in the energy sector will be the increased utilization of energy efficiency and conservation technologies in Mexico, and increased transfers (sales) of renewable energy services and technologies from the U.S. to Mexico.

E. "SPECIAL ACTIVITIES"/CENTRAL AMERICA/AID/W MANAGEMENT

1. Rationale and Strategy

The purposes of this component are to: (1) foster the opportunity for multi-lateral cooperation among the nations of Central America; (2) maintain the flexibility to respond to significant "windows of opportunity" for addressing GCC activities outside of "key" countries; and (3) provide for overall program operational support, audits, evaluations, and contingency funds. These sub-components are described below.

2. Project Elements and Ongoing Activities

i. Central America

Among the Governments of Central America there is a growing recognition of the benefits that can accrue from regional cooperation in addressing common problems. In the E/NR arena this is demonstrated by the formation of the Presidential Commission on Development and Environment. E/GCC will both capitalize on opportunities to foster this nascent cooperation, and take advantage of the benefits of regional collaboration with other donors, NGOs, etc.

An example of Central American activities in which E/GCC will become involved is support for the purchase of 42,000 acres essential to the establishment of the Rio Bravo conservation area in Belize. Funds are also being provided for development of a management plan and for developing security for the entire 215,000 acre Rio Bravo Conservation Area. This land contains prime tropical forests and is part of the "Programme for Belize," a nation-wide effort of training, public education, land

management, and pilot economic-development activities directed to the sustainable use of the nation's resources. In addition, Rio Bravo is adjacent to the Maya Biosphere Reserve in Guatemala, and in close proximity to Calakmul in Mexico, two other reserves receiving A.I.D. support. The proximity of the reserves provides the opportunity for a tri-national biosphere reserve. E/GCC in collaboration with the USAID Missions will promote opportunities for the exchange of information and cooperation among the reserves. In addition, other opportunities for promoting international cooperation in the region on GCC issues will be explored and developed with the bilateral Missions and ROCAP.

ii. "Special Activities"

E/GCC needs to maintain the flexibility to respond to Congressional mandates for activities outside of "key" countries. For example, in the Global Climate Change Initiative legislation, A.I.D. was directed to "... increase the number and expertise of A.I.D. personnel devoted to end-use energy efficiency, renewable energy, and environmental activities in all bureaus and missions..." and to "... devote increased resources to technical training of mission directors, in energy planning, energy conservation, end-use energy efficiency, renewable energy, reforestation, and biodiversity." To meet this Congressional Directive the LAC Bureau provided, in conjunction with buy-ins from other regional Bureaus and R&D, \$146,330 of FY '90 funds for a three year contract to design, implement, and manage an energy and natural resource management training program developed by the PFM/PM Training Division. In the GCC legislation A.I.D. was also permitted and encouraged to use program funds for the travel of direct hire staff in support of E/NR management activities. What new Congressional directives there will be can not be predicted, but the potential for new ones exists and must be taken into account when planning program implementation.

Unique and significant opportunities also arise for addressing GCC outside of "key" countries, and GC/LAC has determined that a limited amount of funds from the GCC reserve may be used in special cases to fund such activities in countries with which A.I.D. does not have major bilateral programs, so long as these actions are supportive of the Initiative. In FY '90 A.I.D. under E/GCC made a \$500,000 matching grant to The Nature Conservancy, in conjunction with the World Bank, support for the long-term protection of the threatened 143,000 acre Mbaracayu Nature Reserve in eastern Paraguay. The Mbaracayu tract is covered by a virgin forest of rich biodiversity, the last large single-ownership tract of dense humid sub-tropical forest in southern Latin America. Present are endangered plants and animals, a vestige of the unique "Mata Atalantica" of Brazil, now 93% destroyed. It is planned that the reserve and its surrounding area will be managed as a biosphere reserve with the

development of economic activities that will benefit local inhabitants. Aside from the value of protecting Mbaracayu, A.I.D. support for this activity was important in setting a precedent of involving the World Bank, with its vast resources and extensive credit to LAC countries, in addressing GCC issues and conserving tropical forests and biodiversity in the LAC region. E/GCC will maintain the flexibility to respond to similar opportunities.

The U.S. executive branch also has a heightened interest in GCC issues and the conservation of tropical forests. E/GCC when appropriate will serve as the mechanism for responding to executive directives in these areas. As an example \$3 million was provided as part of the U.S. governments commitment to provide support to the Rain Forest Trust Fund of the G-7's Brazil Rain Forest Conservation Pilot Program.

3. End of Project Status

At the end of the E/GCC program the following outputs will be accomplished:

(1) A.I.D. staff and Mission Directors better trained and sensitive to the importance of integrating environmental concerns into development;

(2) Atleast two reserves established, protected, and managed in a sustainable way, such that activities on the reserves are economically competitive to prevailing destructive practices and yet sustainable (maintaining forest cover and biodiversity);

(3) Respond to future unique opportunities outside of "key" countries and when appropriate to unexpected Congressional mandates or Executive directives regarding GCC issues.

Environment/Global Climate Change Budget

	FY '90	FY '91	FY '92	FY '93	FY '94	
<u>Mexico Project</u>						
FOREST MANAGEMENT						
Calakmul Biosphere	133,000	121,150	75,000			329,150
S. Mex. Forest Cons.	20,000					20,000
Trop. For. Act Prog			200,000	250,000	250,000	700,000
Land-Use Mont/Res			200,000	200,000		400,000
Debt-for-Nature Swap	47,000	364,850	165,150	250,000	250,000	1,077,000
Buffer Zone Mgt.	650,000	650,000		751,500	749,500	2,801,000
N. Border Wildlands		160,000		160,000	160,000	480,000
Parks-in-Peril		528,000	558,000	550,000	579,000	2,215,000
Silvo-Pastoral Dem.			25,000	25,000		50,000
Subtotal	850,000	1,824,000	1,223,150	2,186,500	1,988,500	8,072,150
POLICIES/INSTITUTIONS						
ENR Plan & Mngt	99,330		34,850	100,000	100,000	334,180
Env. Policy Studies			165,000	200,000	100,000	465,000
ADC Training		200,000	187,000			387,000
Subtotal	99,330	200,000	386,850	300,000	200,000	1,186,180
ENERGY						
Energy Training		100,000				100,000
Demand Side Mgt.		333,000		250,000	200,000	783,000
Renewable EY			250,000	250,000	200,000	700,000
Subtotal		433,000	250,000	500,000	400,000	1,583,000
OPERATIONAL SUPPORT						
GCC Conference		15,000				15,000
USPSC GCC Advisor		100,000	140,000	130,000	200,000	570,000
GCC Support	670					670
Subtotal	670	115,000	140,000	130,000	200,000	585,670
Mexico Total	950,000	2,572,000	2,000,000	3,116,500	2,788,500	11,427,000
<u>Brazil Project</u>						
SUSTAINABLE USE						
World Wildlife Fund	425,000	828,000	875,000	875,000	875,000	3,878,000
Univ. of Florida	378,640	475,000	410,000	410,000	410,000	2,083,640
Energy Eff. Inst.*	200,000					200,000
USDA/Forest Service		267,000	300,000	250,000	250,000	1,067,000
GENESYS		296,000				296,000
Cultural Survival			265,000	450,000	500,000	1,215,000
Agroforestry Research				50,000	100,000	150,000
Subtotal	1,003,640	1,866,000	1,850,000	2,035,000	2,135,000	8,889,640

	FY '90	FY '91	FY '92	FY '93	FY '94	
<u>Brazil Project (cont.)</u>						
SUSTAINABLE USE						
Nat. Res. Econ.	100,000					100,000
EPA		50,000		50,000	50,000	150,000
Env Law Inst		119,169	240,000	250,000	250,000	859,169
ADC Training		290,019	250,000	250,000	250,000	1,040,019
Environmental Ed.				50,000	100,000	150,000
Subtotal	100,000	459,188	490,000	600,000	650,000	2,299,188
OPERATIONAL SUPPORT						
FNPSC GCC Advisor	100,000		60,000	62,500	65,000	287,500
USPSC GCC Advisor		84,000	110,000	112,500	115,000	421,500
GCC Support			10,000			10,000
Subtotal	100,000	84,000	180,000	175,000	180,000	719,000
Brazil Total	1,203,640	2,409,188	2,520,000	2,810,000	2,965,000	11,907,828
* Funds for Energy Efficiency Institute will be deobligated and reobligated for Agroforestry Reseach						
<u>Special Activities & AID/W</u>						
Brazil RFT			3,000,000			
Mbaracayu	500,000					
Env. Trn. for AID Staff	146,330					
Rio Bravo Land Purchase		500,000	500,000	500,000		
PFB Strength		481,000				
M & E			200,000	200,000	400,000	800,000
Subtotal	646,330	981,000	3,700,000	700,000	400,000	6,427,330
<u>E/GCC Total</u>	2,799,970	5,962,188	8,220,000	6,626,500	6,153,500	29,762,158

	FY '90	FY '91	FY '92	FY '93	FY '94	
Other LAC Project's Support for E/GCC						
<u>Environmental Support Project</u>						
Brazil PSC GCC Advisor	110,000					
Mex PSC GCC Advisor	361,713					
<u>PD&S</u>						
Brazil Proj Design	25,405	22,000				
PP Design		29,809				
Total	497,118	51,809				
LAC GCC Initiative Total	3,297,088	6,013,997	8,220,000	6,626,500	6,153,500	30,311,085

IV. PROGRAM IMPLEMENTATION AND MANAGEMENT

A. Roles of AID/W and USAIDS

E/GCC is a regional Program. The Chief of the LAC Environment, Energy, and Science Staff will be the Program Officer and will retain overall responsibility for the Program. Management of "key" country components and special activities, however, will be delegated to the USAID/Missions in the countries where the activities occur. Management includes responsibility for the ongoing oversight of activities, and project reporting, evaluations, and audits. Reports on the progress of implementing E/GCC activities will be submitted to the Program Officer on a semi-annual basis as part of the semi-annual review (SAR) process. Each activity will be reported on individually using a SAR format modified appropriately to the nature of the activity.

Because E/GCC is a regional program, field staff is often limited in number, and high Congressional, Executive, and public interest exists in the program, there will be a clear consensus between the Missions and AID/W about funding decisions for specific activities. The yearly Action Plan review will be the formal mechanism through which consensus between AID/W and the missions is reached. New activity descriptions will be submitted for AID/W concurrence, as part of the Annual Action Plan review process.

B. Implementation Plan

Implementation of the E/GCC program began in FY 1990, the first year of the Congressional Earmark. Preceding the obligation of funds was the development and review of program strategies for Mexico and Brazil, and carefully review of all proposed activities to assure that they fit within these respective strategies. A Project Identification Document for E/GCC was reviewed and approved February of 1991. In the absence of an approved Project Paper funding for all activities have been authorized by the Assistant Administrator for LAC (see attached Authorization Memos).

E/GCC activities have been and will continue to be implemented mainly through grants and cooperative agreements with NGOs. Personal Services Contracts (PSCs) and Interagency Agreements have and will continue to be employed, and on occasions implementation may occur through direct funds for Host Government and direct A.I.D. procurement.

Activities will be selected on the basis of unsolicited proposals, predominant capability, and competition. AID Mission Directors/Representatives will be responsible for the development

of E/GCC components in "key" countries. This includes the development, review, and recommendation of proposals to be funded; and the monitoring, auditing, and evaluation of the activities.

C. Audits

The costs for auditing individual activities is contained within the funds provided for those activities. All proper procedures and requirements are made a part of the agreements/contracts through which the activities receive funds. The expense of auditing the program overall will be borne by the Federal auditing system. Consequently, no additional funds need to be set aside specifically for audits.

V. PROGRAM MONITORING AND EVALUATION PLAN

A. Introduction

This Monitoring and Evaluation plan outlines the system the LAC Bureau will employ for monitoring and reporting progress and impacts of A.I.D.'s GCC and Initiative in the region, including the activities of other A.I.D. Bureaus (e.g. R&D and PRE) whose activities are being implemented in support of the regional GCC Initiative. Established are each principal participant's role in measuring progress toward achieving the Initiative's objectives of reducing deforestation and increasing energy efficiency.

GCC Monitoring and Evaluation activities will be conducted at three levels: 1) the individual country activities and Special Activities component; 2) the "key" country programs; and 3) the overall regional initiative. The purposes of GCC monitoring and evaluation are to report progress at all three levels towards achieving the Initiative's objectives, and to provide information for making changes in the management of activities and funding allocations as needed.

The monitoring and evaluation system will be developed within the framework of the LAC Bureau's Program Performance Assessment System (PPAS) and the Agency's Program Performance Information System for Strategic Management (PRISM). LAC's PPAS encompasses: (1) strategic planning by identifying program-level strategic objectives, and (2) program assessment through the identification of performance indicators. LAC Missions establish their own respective objectives and indicators within the framework of addressing the Bureau's broader established objectives. PPAS provides linkage between the Bureau's objectives and the USAID's program activities and strategic objectives. PRISM is being introduced Agency-wide by the Policy Directorate's Center for Development Information and Evaluation

(POL/CDIE) as a framework for monitoring and reporting overall A.I.D. program performance. PRISM directly supports the LAC Bureau's PPAS by providing technical assistance to field mission staffs in development of objectives, indicators, and related information systems.

B. ROLES and RESPONSIBILITIES

i. The Implementing Organizations -- Many implementing organizations are already at work on the LAC region GCC Initiative. As the Initiative develops, additional organizations may be identified. Under A.I.D. review and direction, the implementing organizations will have the following responsibilities monitoring and evaluation:

- (a) Proposing indicators and targets for tracking performance and measuring the impacts of their activities.
- (b) Collecting and compiling the data for measuring the performance indicators of their respective activities;
- (c) Reporting data on performance indicators to A.I.D. according to an agreed schedule and format;
- (d) Contributing to and participating in special evaluation studies as needed.

A.I.D. will work with each organization to further identify its role in the monitoring and evaluation process, its contributions to the Initiative, and the indicators it needs to track and measure.

ii. USAIDs & AID/W.

The Bureau for Latin America and the Caribbean is responsible for the overall direction of the Agency's GCC Initiative in the LAC region. With AID/W review the development and management of the "key" country and special activity component have been substantially delegated to the participating USAIDs. The USAIDs will be responsible for the design and implementation of the monitoring and evaluation plans for their country GCC programs, and for working with AID/W in monitoring and evaluation activities for the overall regional E/GCC program. AID/W will review and approve the USAID's plans, and will be responsible for the development and implementation of the overall E/GCC program indicators, and for evaluation and reporting on the Initiative's overall performance. AID/W will also be responsible for integration of the Initiative's monitoring and evaluation system with the Agency-wide PRISM system. USAID's are

responsible for the tasks below, for which AID/W will provide assistance when feasible:

- (a) Monitoring of program implementation (assuring that conditions of agreements, contracts, etc. are being fulfilled).
- (b) Developing country-level indicators and baseline data.
- (c) Working with the implementing organizations to identify indicators and establish baselines for measuring the impact of individual activities on achieving objectives; and assisting in the integration of the overall Initiative and Country level indicators into the implementing organization's internal processes of data collection and analysis for reporting to each USAID.
- (d) Verifying the accuracy of performance indicator data reported by the implementing organizations.
- (e) Setting schedules for collecting, compiling and reporting performance indicator data by the implementing organizations, and ensuring compliance;
- (f) Reviewing and approving monitoring, evaluation, and impact reports prepared by the implementing organizations;
- (g) Compiling annual composite reports on their respective GCC country program.
- (h) Using monitoring and evaluation reports to plan future funding allocations.
- (i) Assisting AID/W in producing reports and carrying out external evaluations of the overall regional E/GCC initiative.

iii. External Technical Assistance

External technical assistance may be needed for:

- (a) Integration of Country GCC Program Objectives into grantee data collection and reporting. Grantees will need to be on board as to how their activity contributes to achieving the program objectives, will need to be collecting data relevant to measuring the indicators, and will have to report it at a time and in a form useful for the individuals making composite reports.

- (b) Crosscutting studies, testing assumptions, or reporting on the combined effects of more than one grantee/ implementor.
- (c) Assistance to USAIDs in preparing composite "key" country reports, and to LAC/W in preparing reports on the overall regional initiative.

Given the monitoring and evaluation and abilities already possessed by LAC/W, the USAIDs, and the implementing organizations, and the uncertainties of what may be needed in the future, the program's monitoring and evaluation needs can best be met through flexible mechanisms such as buy-ins to centrally funded projects (i.e. PRISM and GENESES), through IQCs, and through Purchase Orders. These mechanism will be accessed on an as-needed basis, when specific requirements are well defined. This approach will produce a more cost effective monitoring and evaluation system that will better meet the program's needs.

The USAIDs will provide for review to AID/W a monitoring and evaluation plan for their respective country program, including the current status of any evaluation activities, a schedule for implementation of future activities, and a draft description of the types of assistance needed with a budget of the estimated costs by year.

VI. PROJECT ANALYSES

- A. Forestry Analysis
- B. Energy Analysis
- C. Social
- D. Training

SUMMARY OF FORESTRY TECHNICAL ANALYSIS

I. Problem Statement

1. Forest and Global Warming

Carbon dioxide is the most abundant atmospheric trace gas in terms of volume and weight. It is also recognized as both the single largest anthropogenic and natural source of greenhouse forcing. In addition to its abundance, CO₂ has the distinction of being the green house gas (GHG) with the second longest residence time - some 100 years. The combination of accelerating emissions and this lengthy atmospheric presence single out CO₂ as the major culprit in suspected global warming trends. While other U.S. Agencies such as the Environmental Protection Agency and the Department of State are concentrating most of their efforts on chloroflourocarbon emissions, the LAC Bureau of A.I.D. has determined that its comparative advantage lies in reducing carbon emissions emanating primarily from conversion of the world's tropical forests.

According to the World Resources Institute¹ 77 percent of the total atmospheric flux of anthropogenic CO₂ results from industrial sources. Almost 75 percent of this originates from industrialized ("developed") countries. The remaining 25 percent is then contributed by developing countries through biomass combustion associated with conversion of tropical forests to alternative land uses. In most countries within South and Central America forest clearing contributes at least 10 times the amount of carbon as does industrial production and fossil fuel combustion².

2. Deforestation's Contribution

As stated above anthropogenic alterations and wholesale conversion of tropical forests accounts for most of the developing world's carbon contribution. The relative donation of tropical forest conversion to total emissions is accelerating rate as land clearing proceeds faster than industrial development. Although several LAC countries such as Jamaica, El Salvador a Mexico have reached a stage where industrial sources produce more carbon dioxide than land clearing this is not generalized throughout the region.

Forests are doubly important in that their presence represents the largest terrestrial sink for carbon. The photosynthetic ability of trees to sequester CO₂ into woody biomass has unparalleled efficiency. The conversion of forests through burning not only removes the sequestering capability but releases enormous quantities of stored carbon in forest litter, roots and soil into the atmosphere upon incineration and for long periods thereafter.

¹ A guide to the global environment. 1992. Washington, D.C.

² World Resources Institute. 1990. Guide to the global environment.

Nearly 50 percent of the total carbon contained in standing forests, varying from 170 t/ha in moist tropical forests to less than 40 t/ha in tropical dryland forests, is emitted immediately into the atmosphere upon conversion. This emission occurs in three phased patterns: 1) immediate emission through biomass incineration and soil exposure associated with initial land clearing; 2) intermediate flux occurring over the next several months to years as decay and volatilization of remaining branchwood and soil carbon continues; and 3) the longer-term transformation associated with stump, root system, and additional soil microbiological decay.

Estimates of atmospheric carbon emissions from the most significant countries vary from year to year depending on data availability and quality. There are also significant variations in anthropogenic sources owing to fluctuations in climate, macroeconomic trends which support accelerated land-use change, and policy alterations creating incentives for forest encroachment for various reasons. Illustrative estimates of land-use change-driven emissions for 1987 and 1989 give some idea as to the orders of magnitude. The significant jump in figures is apparently more due to a change in standards and measures than to actual changes in emissions. The following figures are in 000 metric tons of carbon emitted in the indicated years:

<u>Country</u>	<u>1987³</u>	<u>1989⁴</u>
Brazil	540,000	950,000
Colombia	54,000	420,000
Ecuador	17,000	160,000
Mexico	14,000	200,000
Costa Rica	6,600	26,000
Guatemala	4,300	41,000
Jamaica	25	810
United States	2,600	22,000
World	1,200,000	6,400,000

Given the well documented contribution of tropical deforestation to the composite global CO₂ flux, regardless of the magnitude of impact, forest management options maintain one of the greatest mitigation opportunities. More than 50 percent of the earth's forests are located in the tropical regions of developing countries. In addition to international concern for global climate change forest industries in these countries generate full-time employment for more than three million people and more casual income from informal markets for hundreds of millions of others. Forests provide the fuel, food, paper fiber, construction materials, and medicinal products essential to support continuing

³ R. A. Houghton, R.D. Boone, J.R. Fruci et al, World Resources Institute.

⁴ World Resources Institute op cit.

development. The U.S. Government's "no regrets" policy and interest in improving the management of these global forest assets, in fact, could supply positive economic growth benefits well beyond CO2 emission regulation.

Industrial growth and economic development aspects notwithstanding, tropical forest also provide critical habitat for potentially valuable, poorly catalogued and quickly eroding biological diversity. The volumes of information of food stuffs, biotechnologies and pharmaceutical products underline the disintegrate of these critical forest habitats which also contain thousands of critically endangered species. The justification for tropical forest management and productive conservation, however, goes well beyond the potentials of biodiversity. Bioclimatologists have been modeling for decades the importance of lowland and montane forests in critical water cycle functions and the invaluable regulatory functions of forested watershed for delivery of drinking and irrigation water and generating hydroelectricity are well understood. Conservation of forests for carbon sequestering thus has significant complementary value which, in the immediate term, are more important to local economies than the warming trends.

3. Tropical Deforestation in Latin America

Tropical forests in Latin America are disappearing at both relative and actual rates faster than any other region in the world. An estimated 12,272,000 hectares of tropical American forests are converted to other uses annually with Africa and Asia experiencing losses that are less than 30 percent of this figure. This represents a 2.7 percent loss per annum. This is an astonishing frequency given the fact that per capita forest land is higher in LAC by nearly a factor (1.8 ha versus 0.7 in Africa and 0.1 in Asia) while woodlands, as a percentage of total land area, is twice that of the other regions. Forests are clearly undervalued -- undermanaged resources that are being squandered at rates which undermine sustainable development.

In order to understand the present trends in loss of forest cover worldwide it is worth considering some of the physical aspects of the resource, the use-demand characteristics, and then weigh the amount of resources allocated to developing the human, political, and capital infrastructure. The following table provides some "broad-brush" descriptors of tropical forest resources:

1990 Forest Resource Characteristics	LAC	AFRICA	ASIA
<i>Closed Forests (million has.)</i>	722	220	409
<i>Open Forests (million has.)</i>	207	465	87
<i>Forest (million has.)</i>	929	685	496
<i>Plantations (million has.)</i>	4.6	1.8	5.2
<i>Forest Land Per Capita</i>	1.8	0.7	0.1
<i>Forest as % of Total Land Area</i>	47	27	25
<i>Annual Deforestation ('000 ha)</i>	1,2272	3,822	4405
<i>Reforestation (as % of deforest)</i>	0.53	0.13	0.43
<i>Forest Management Projects</i>	45	170	320
<i>Forest Research Exp.(mil \$/y)</i>	27	26	103
<i>Forestry Schools</i>	63	58	147

With some of the forest sector's vital statistics in hand, it is not surprising that LAC leads the world in deforestation given the comparatively low level of support forest management, research and education has received in the region in recent history. Research expenditures are nearly equivalent to those in Africa, although the forest estate and its contribution to national economies are vastly superior in the LAC region. The number of forestry schools is equally impoverished, with LAC having the same number of institutions as Africa and a third that of Asia. In total numbers and relative to the size of forested area, LAC has traditionally neglected formal education in the forestry sector with not surprising results: greatly understaffed public sector institutions, ill-informed policy decisions, and an often dynamic but unbridled forest industry not committed to sustainable extraction.

Deforestation in LAC is the final manifestation of several inextricably linked causal agents that defy simplistic interpretation or easy isolation. The synergy between inadequate or inappropriate policies and regulatory capability is compounded by a lack of ecological information upon which forest management practices can be based. Politics and technical considerations aside, matters are further complicated by the rich mosaic of stakeholders and land security interests. The end result, which must be reversed is agricultural encroachment into forested areas incapable of sustaining agricultural production.

II. Solutions

As has been discussed above AID has chosen to focus on those activities which are within its comparative advantage. Centering on natural resources management and, to a lesser extent, energy efficiency, AID still has some important decisions to make as to exactly what actions can provide the maximum benefits.

1. Possible Forest Management Options

There are three generic option domains available for forestry to impact positively on global climate change: 1) decreasing carbon emissions; 2) maintain sinks; or 3) increase sinks.

While there is considerable conceptual overlap the principle distinction is that the decreasing-emissions option focusses on protecting and reducing combustion and conversion of forest land to other uses. Illustrative efforts for this option includes support for proper land-use planning, development of protected area systems, fire management and improving vegetative cover on already denuded forests. These options are usually the most cost-effective but may be out of sync with economic development realities. For example, protected areas have received historical emphasis, but the increasing recognition that unless forest produces some tangible economic goods and services to local communities through extraction of timber and non-timber products, forests will be of little immediate economic value and, therefore, destroyed by the local people.

<i>POSSIBLE STRATEGIES</i>	<i>POLICY GOALS</i>	<i>POSSIBLE INTERVENTIONS</i>
<i>1. Decrease Carbon Emissions</i>	<ul style="list-style-type: none"> <i>a. Preserve Forests</i> <i>b. Manage Conversion</i> <i>c. Decrease forest product consumption</i> 	<ul style="list-style-type: none"> <i>* Create Parks</i> <i>* Extract reserves</i> <i>* Fire Management</i> <i>* Land-Use Plans</i> <i>* slow post-harvest soil loss through agroforestry</i> <i>* Fuel efficient stoves</i>
<i>2. Maintain Carbon Sinks</i>	<ul style="list-style-type: none"> <i>a. Preserve Forests (parks)</i> <i>b. Intensify Forest Management</i> <i>c. Enhance Forest Policy and Improve Compliance</i> <i>d. Improve market Incentives for sustained yield management</i> 	<ul style="list-style-type: none"> <i>* GIS/Land-Use Assessment</i> <i>* Processing efficiency</i> <i>* Sustained-yield management</i> <i>* Diversify species and forest products</i> <i>* Natural Forest Management</i>
<i>3. Increase Carbon Sinks</i>	<ul style="list-style-type: none"> <i>a. Promote Economic Policy Incentives for Forest Management</i> <i>b. Tree-based crop promotion</i> <i>c. Encourage technologies which require more wood</i> 	<ul style="list-style-type: none"> <i>* Manage secondary forests</i> <i>* Forest Plantation</i> <i>* Pasture reforestation</i> <i>* Stimulate construction technologies which use more timber</i>

The second option and its illustrative prescriptions are geared to maintain forests by improving their economic as well as ecological contribution -- management of extant resources within guidelines and practices which promote extraction levels, markets, and product diversification commensurate with sustainably using while limiting disturbance to

forest. Increasing land-use assessment capability and management planning so that timber and non-timber extraction occurs within allowable annual cut practices (interest only removed) and improving industry efficiency, offer possibilities to maintain sinks. Creating market incentives which defray costs, such as ecological certification programs for improved management practices, are important to encourage industry participation.

The final option, increasing forest carbon sinks, aims at actually increasing the area under forest for sequestering purposes. Activities such as plantation management, encouragement of more intensive management of secondary and degraded forests and methods of increasing the use of timber in housing and commercial construction offer possibilities.

These strategic options can be further divided into a variety of policy goals which can in turn be translated into specific interventions. Nearly all interventions require three critical elements namely 1) political will to act through policy reforms; 2) institutional ability to enact policy through planning and compliance; and 3) technical information and local support insure success through practices.

a. Cost and Logistical Considerations

The E/GCC project must take into account, and in fact coordinate closely with, other donors working to balance global carbon dioxide loading through capital-intensive energy efficiency, renewable energy, and natural resource management programs. Least costs considerations, institutional capabilities, policy considerations and technical realities suggest the E/GCC project should concentrate efforts on the reduction of carbon emissions and maintenance of carbon sink strategies. AID does not have either the technical and managerial capacity or financial resources to undertake activities seeking to increase carbon sinks. Consequently E/GCC's limited resources and the unprecedented scale of intervention needed to address global climate change, strongly suggest that E/GCC efforts capitalize on improved protection, management, and production of extant forest assets. Although it is generally recognized that forest plantations of fast growing trees are the most effective means of sequestering carbon, costs associated with plantation establishment in LAC countries tends to range from \$100 to \$1000 per hectare. Rehabilitation of pastures and secondary forest are less expensive options but are more costly and more economically and ecologically precarious than management of natural production and protection forest.

Experience from several geographic areas suggest unit costs per area are generally similar to those below:

<u>INTERVENTION</u>	<u>COST RANGE PER HECTARE</u>
<i>Hardwood Plantations</i>	\$300-1000
<i>Degraded Pasture Reforestation</i>	\$200-400
<i>Secondary Forest Management</i>	\$150-250
<i>Natural Forest Management</i>	\$50-100
<i>Extractive Reserves</i>	\$25-50
<i>Parks/Protected Area Mgt.</i>	\$10-100

Regardless of actual intervention costs, sequestering of carbon per unit area is most efficient in lowland tropical areas where conditions for spectacular growth - estimated 160-170 t/ha - allow high carbon storage as opposed to open dryland forests which maintain sinks in the 10-40 t/ha range. Therefore the E/GCC project will concentrate forest management interventions in tropical lowland forest areas to the greatest extent possible.

b. Policy Considerations

Reconciliation of long-term economic costs of deforestation with the need to make immediate financial investments in improved stewardship involves three basic policy reform arenas which will require closely phased or simultaneous attention within E/GCC activities. First, trade policies must be liberalized to allow all owners to seek the highest possible price on domestic and international markets. Second, this must be accompanied by regulatory reforms in the land-use classification, adjudication and enforcement so that longer concession tenure and the required investment for best management practices occurs. Finally, administrative reforms within the regulatory agencies managing forest land and the modernization of stumpage and royalty structures must be implemented simultaneously to revitalize the husbandry of forested lands.

Liberalized forest trade policies blended with more transparent stumpage valuation and collection schemes appear to be essential ingredients for stemming the rapid loss of LAC's tropical forests. It is increasingly recognized that restrictive forest product trade policies, and cumbersome or ineffective cutting-permit and concession systems undervalue timber and non-timber products. These policies act as major disincentives for industry to operate in a more environmentally responsible fashion and, combined with misguided agrarian reform practices and ill-conceived credit subsidies for other land uses, erode forest value and hasten deforestation rates. Gregerson⁵ correctly notes that sustained yield forest management becomes economically viable only when timber prices justify more intensive management, and only when governments institute effective and stabilized land-use and incentives for industry participation in management.

Another common cause of timber undervaluation is that forest revenue systems for

⁵ Gregerson, H., L. Lundgren and G. Lindell. 1990. Contributions of tropical forests to sustainable development: the role of industry and trade. Univ. Minnesota. St. Paul. 10 pp.

publicly-held forests frequently fail to adequately account for inappropriate extraction practices which can have long-term economic and ecological costs. Costs associated with proper logging that would assure the residual stand's regenerative capacity and would value other ecological service such as watershed and biodiversity, are typically not included in stumpage valuation. Certification schemes, such as the Rainforest Alliance "Smartwood" program which seek to include these costs by remunerating firms using socially equitable and ecologically sensitive practices management practices, is one way of increasing incentives.

Another method for improving motivation is the reform of concession systems which perpetuate undervaluation, most often on publically-held forest, through: 1) overly complex concession permit structures dependent on non-functional agencies; 2) capricious and inflation-eroded stumpage pricing; 3) non-competitive concession bidding, awarding, and arbitrary revocation; 4) systems based on extracted volume instead of area harvested; and 5) absences of penalties or enforcement for excessive damage to residual stands and remaining forest ecosystem.

The constraints and opportunities described above to sustainable and economically viable forest management will be investigated and addressed within the E/GCC programs and addressed through NGO partner affiliations and through direct dialogue with host country officials. An emphasis will be placed on transferring management to people in local communities where there is the greatest incentive for employing sustained yield management of forests.

III. Implementation Considerations

The choice of partner for different components of the E/GCC project will be largely dependent on institutional strength and field capability. Limited capacity within Mexico and Brazil's forest services mandate that the project support complementary NGO efforts, while also supporting strengthened government capacity. Most often land-use planning activities will need to be conducted in close association with government agencies, particularly at the State.

1. Selection of Alternatives

The E/GCC components for Brazil, Central America and Mexico have been selected through a critical constraints analysis which has attempted to identify and support the weakest link in the policy-planning-practices chain in each country. These constraints were overlaid with least cost alternatives, the institutional capabilities, needs of government and non-government organizations, and the operational limitations of A.I.D.'s resident staff. Specific activity descriptions are offered in the PP annexes.

It is worth noting that although there is a reasonable understanding of mitigative

technologies, promising institutional strengthening options, and some rough estimates of costs associated with various strategies and activities, the E/GCC program will need to be opportunistic and take advantage of situations as they arise. Activities in Brazil and Mexico may be very different as is AID's presence and experience in those countries.

a. Brazil

In the case of Brazil, all three strategic options require attention and are receiving nearly equal project weight. Ongoing activities in land-use analysis and planning in Acre are supported by complementary work in extractive reserves management and development of sustainable forestry practices through applied research. Promising timber management strategies will be tested and support for policy reforms which increase investment incentives will be explored. Policies which are biased against forestry (cattle ranching subsidies, transmigration programs, land reform inequalities) will be reviewed and every attempt will be made to promote reform these accordingly. Because of the sheer size of Brazil AID will continue to concentrate efforts in Acre and Para, expanding to perhaps one other areas as management capacity and opportunities arise.

b. Central America

The Central American component requires a more opportunistic approach given the high level of interest and funding in Bilateral and Regional efforts planned or underway. Thus far under E/GCC, \$1.5 million has been authorized to support the purchase of the additional land for Program for Belize's Rio Bravo property, and an additional \$481,000 for the development and initial implementation of a management plan, for surveillance and protection activities, and for enhancing applied research capability on the Rio Bravo property.

c. Mexico

The situation in Mexico is similar to Brazil where several efforts along the policy-planning-practices continuum need to be undertaken simultaneously. Southern Mexico's tropical lowland forests offer the best opportunities for reducing emissions and maintaining sinks through forest management. Much of the effort will be focussed on developing alternative sources of forest products (agroforestry, community forest plans) so that pressure on remaining natural stands can be reduced. Development of extractive reserves and improved natural forest management activities are complementary activities designed to maintain carbon stores through additional local support. Activities will be focused around and in legal declared protected areas and reserves that have extensive tropical forests.

Technical Analysis for the ENERGY SECTOR

BACKGROUND: The Global Warming Potential (GWP) of gases released in 1989 as a result of deforestation in Brazil was estimated to be equivalent to 950 million metric tons of CO₂, or more than 4.5 times that of all other energy, industrial, and farming sources in the country combined. Most of the deforestation responsible for these emissions occurred in the Amazon Basin. Because of this, the limited A.I.D. financial and staff resources available for working in Brazil, and the Agency's past extensive experience in E/NR management, it was decided that A.I.D. could have the greatest impact in addressing the emission of GCC gases in Brazil by focussing on sustainable forest management in the Amazon Basin, and not directing any of its resources to energy sources of greenhouse gases. In contrast energy production in Mexico emits the GWP equivalent of approximately 324 million tons of CO₂, compared to 200 millions tons due to deforestation. Despite this, the relatively massive investment of others in Mexico's energy sector (approximately 7 billion in 1991-92) has resulted in the LAC Bureau concluding that A.I.D.'s dollars would also have the greatest impact in the forestry sector in Mexico where A.I.D. is a principle donor for sustainable forest use. As argued below, though, the conclusion has been reached that a modest amount of E/GCC funds can have a disproportionate impact in the Mexico energy sector by having an instrumental role in directing other donors attention to promoting energy efficiency and renewable/alternative energy sources.

DISCUSSION: Mexico is one of A.I.D.'s key countries in terms of its relative contribution to the potential threat of global climate change. With its large but shrinking forest cover and large and growing energy sector, the country is critical both as a sink for and generator of CO₂.

Mexico's energy sector generates more CO₂ emissions per year (estimated at 250 million metric tones) than any other country in Latin America, and it is the third largest emitter among all A.I.D.-assisted nations (behind Poland and India).

The energy sector programs proposed for Mexico are limited to those that will unequivocally reduce the relative emissions of CO₂. But within that context, it is important to state that all A.I.D.-funded activities will simultaneously be supported by an economic argument and in almost all cases also will result in a reduction of emissions that cause local air quality problems. Both of these subjects are of great concern to Mexico and may in fact be critical to Mexican collaboration.

This project chooses to focus on the electricity or power sector. The electricity sector is responsible for approximately 21 percent of Mexico's energy-related CO₂ emissions. The combustion of fossil fuels is the major cause of increases in CO₂ concentrations in the atmosphere, and approximately 65 percent of all electricity

generation in Mexico comes from fossil fuels.

At the same time, power generation facilities are the single largest recipient of government development funds, and current expansion plans, considered necessary for economic development, call for an investment of approximate \$33 billion during the 1990s. It is unlikely that the Mexican government will be able to gain access to that level of capital, and so any programs that can reduce that requirement while maintaining economic growth will be welcomed.

A.I.D. has significant experience in the power sector and can offer assistance with regard to power sector planning and policy, programs to increase efficiency, and the use of renewable energy. Any program that increases efficiency at any level (supply, distribution, or end uses) of a power system that is using fossil fuels reduces the generation of CO₂ proportionately. Any generation facilities that use renewable energy instead of fossil fuels will also reduce CO₂ emissions. The use of renewable energy resources results in virtually no net addition of CO₂. A program of assistance can include activities directly in these areas and also provide important direction through policies and planning methodologies that in turn lead to such activities. Within each of these program areas, the Mexican energy sector provides rich opportunities for effective assistance, as summarized in the balance of this annex.

Although the energy sector activities envisioned by this project can be expected to lead directly to increases in inefficiency and the use of renewable energy, an important and additional strategic intention is the leveraging of multilateral development bank funds, thus providing a multiplier effect. Discussions have been held with representatives of both the World Bank and the Inter-American Development Bank (IDB) toward this end, and both institutions have stated a willingness to use A.I.D. input in making future decisions on loans for the Mexican energy sector. The Agency has established a formal cooperative agreement with World Bank and is in the process of formalizing a memorandum of understanding with the IDB.

The U.S. Environmental Protection Agency (EPA) is interested in collaborating with A.I.D. in the design and implementation of complementary programs in both efficiency and renewable energy. An EPA representative accompanied an A.I.D. definitional mission to Mexico in March 1991. The U.S. Department of Energy has committed itself to co-funding A.I.D.'s efforts on the renewable energy side.

Efficiency

The greatest potential efficiency gains in Mexico are available from the demand side. So-called demand-side management refers to programs that either improve the efficiency of the overall system

by shifting demand away from the peak time, thus requiring less total system capacity (megawatts, or MW), or improve the efficiency of distinct end uses, thus reducing the amount of energy (kilowatt-hours, or kW) required overall.

According to several studies undertaken by Mexican institutions, there is a large untapped potential for savings in both categories and in all end-use sectors, particularly the industrial and commercial sectors. For example, some new time-of-day tariffs have recently been put in place, but they are currently applied to less than one hundred large customers. The savings achieved have been very large, with sixty-four customers alone having reduced their combined demand during peak hours by over 500 MW. Extrapolating this peak load reduction to the total population of large consumers indicates that several thousand megawatts could be saved (the country's total capacity is about 26,000 MW). The reduction in CO₂ emissions would be proportional to the fossil fuel component of Mexico's expansion plan. From an economic standpoint, each 1000 MW of generation capacity costs between \$1 billion and \$1.5 billion, depending on environmental controls. A significant proportion of this typically comes from external loans.

Similarly, there is ample evidence that much of Mexico's electricity-using equipment and appliances are less efficient than the cost-effective state-of-the-art. Energy savings of up to 20 percent in current consumption could be achieved over time with more efficient replacements. Again, the reduction in CO₂ emissions would be proportional.

The design and implementation of demand-side activities is an area in which the national electric utility in Mexico has indicated that U.S. assistance could be effective and appreciated. The objective would be to help the utility, the private sector, and the Mexico City electricity distribution company to prioritize activities, design and implement pilot programs (including load management, efficient lighting, testing and labelling of appliances, etc.), and prepare a multi-year national program of the magnitude needed to make a substantial cut in electricity demand. The U.S. private sector and U.S. utilities have extensive experience in these areas during the past fifteen years, and A.I.D. itself has tapped into this expertise for major programs recently.

Renewable Energy

The opportunities for increased use of renewable energy in Mexico are great because of political support, the technical skills available, and the renewable energy resource base.

President Salinas himself has launched the Programa Nacional de Solaridad (PRONASOL) which aims at improving the provision of various services to rural areas. These services include both

energy itself, for household and small commercial use, and various social services that require energy as an input (for pumping water, health services, education, etc.). PRONASOL has explicitly identified small-scale renewable energy technologies as a major means to this end, and initiated preliminary but major procurement of equipment through both the public and private sectors.

The resource base is large. An estimated 3000 MW of small hydroelectric potential has not yet been developed, and in addition, several hundred abandoned small hydro sites could be returned to service. The sugar and pulp and paper industries offer significant opportunities to generate electric power through cogeneration of heat and electricity based on the industrial residues, both for on-site energy use and for sale to the national grid. Wind and solar resources for electric generation appear to be economic and plentiful, and the country has excellent geothermal resources.

These opportunities to expand power generation through the use of renewable energy technologies can be placed in three categories. "Micro" systems, ideally suited for off-grid electrification applications are now being installed at the rate of approximately 4000 systems per year. These systems range in size from 50 watts to as much as 100 kW, with a total installed capacity of approximately 1 MW per year. This figure is rather deceptive however, as the equivalent capacity needed to provide equivalent service to these locations through conventional power grid extension could be as much as forty to fifty times this figure.

"Small" systems, ranging in size from 100 kW to 1 MW, including wind and hydroelectric power plants, can be developed for both isolated power systems as well as for grid interconnection. Applications for these technologies are numerous. However, due to the legal impediments prohibiting non-CFE power sales, these systems will not be developed until the law is changed (this is one of the policy issues A.I.D. can help address).

Similarly, "intermediate" scale projects ranging in size from 1 MW to 30 MW could be developed by private parties with the sole purpose of providing additional capacity and energy to CFE (this again would require policy adjustments). Wind, solar, small hydro, and biomass opportunities abound. These projects could be developed in blocks of 10 to 30 MW, and some resources (including wind and solar thermal) could be developed in blocks up to 100 MW per project.

The Mexican institutions involved in the PRONASOL program concede that they have made insufficient analysis of what renewable energy resources and technologies are most economic in which locations and situations. They are enthusiastic about the possibility of assistance from A.I.D. in this regard. In addition (and somewhat related to that analytical issue), the systems are currently being

given away, with no attempt at cost recovery. While this may be politically understandable, there is some recognition that in the long run at least partial cost recovery could be very important. These types of analytical and market-oriented advice are appropriate for A.I.D. funding.

Policy, Planning, and Training

Greater efficiency and use of renewable energy can be effected not only at the program level, but through numerous policy actions and approaches to utility sector planning, and of course through formal training.

At the policy level, two issues in particular are relevant. One deals with the question of pricing, the other with the participation of the private sector in power generation. Pricing reforms can affect levels of efficiency and time-of-day use, and thus can be a very important part of a demand-side management program. The tariff study currently being performed in Mexico with help from ENDESA of Chile would constitute an excellent starting point. A.I.D. could fund important follow-up and complementary policy analysis. Also, a major and sustained training program is needed to ensure the success of this component. Training should include formal training in the U.S. of key counterparts as well as training workshops in Mexico and on-the-job training.

A de-monopolization of power generation, allowing the private sector to become involved, would not only raise levels of efficiency (recent studies in developing countries have concluded that private sector generation is more efficient than parastatal generation) but also encourage private sector use of renewable energy resources for generation and sales. Similar policy changes in Central America recently have resulted in private sector exploitation of indigenous renewable fuels, not fossil fuels.

Adoption of innovative planning methodologies also can be critical in providing room and encouragement for efficiency and renewables at top decision-making levels. Utilities have traditionally looked only at a narrow band of supply-side technologies in responding to the challenge of increasing demand. But planning methodologies developed in the U.S. and Europe in the past decade, variously called least-cost planning or integrated resources planning, take a much broader view of environmental costs to consider, what services to provide, what technologies to promote, and how the private sector can contribute. An important approach of such planning, for example, is to put demand-side management programs on an equal footing with supply expansion as options for investment. Such an integrated resource planning approach has not been used yet by Mexico's national utility or energy ministry, but has been cited by Mexican government officials as a good potential area of cooperation with the U.S.

Promoting and then assisting in a few carefully selected activities related to policy and planning at the national level can clearly have a significant impact. Removing legal and institutional barriers, establishing incentives, and adopting planning methodologies that serve to give more support to efficiency improvement and the use of renewable energy activities complement the efforts made at the implementation level and described above.

SOCIAL SOUNDNESS ANALYSIS:

A. Socio-Cultural Context: The socio-cultural context for this program varies greatly within and among the countries selected for program and project activities. In each country, however, there are indigenous groups, colonists in planned and unplanned settlements, subsistence and cash crop farmers, micro- and small-entrepreneurs, ranchers, urban dwellers, and large businesses. Each of these groups play a significant role in underlying causes of climate change through their resource management patterns. Also, any successful interventions will depend on the participation of relevant groups.

In the Amazon region of Brazil, complex migration patterns are part of rapid changes in rural communities. Thousands of families have moved into the region over the past 2 decades. In addition, men often migrate seasonally to work in the mines or agricultural harvesting or clearing of land. Seasonal migration of males for employment is also common in many areas of Mexico and Central America. Women are thus left to act as de facto heads of household for major portions of the year.¹ Approximately 1/3 of the households are female-headed year around in the Amazon regions of Brazil. Regional statistics tell us that 20-40% of Latin American households are headed by women, so we would expect similar numbers in Central America and Mexico, with a similar impact in areas where seasonal migration is a factor.

Approximately 1/3 of the population in Mexico (33% of females and 35% of males) live in rural areas. In Brazil, the rural population accounts for 28% of females and 30% of males (1980-85 statistics from the United Nations Office of Statistics). Basic literacy rates are 77% for females and 79% for males in Brazil, with somewhat higher rates for Mexico of 88% for females and 92% for males. Eighty percent of females and 82% of males in Brazil enroll in secondary school; Mexico matriculation rates are 85% for females and 87% for males.

There is a rapid population growth in all regions targeted by the E/GCC program. This contributes to a high rate of urban migration, especially in Mexico, to greater exploitation of marginal lands and to continual pressure to open forested frontier areas, especially in the Amazon. Large-scale deforestation, loss of soil fertility, destruction of vegetative cover in watersheds are but some of the environmental stresses resulting from increased demand by increased population. In

¹Schmink, Marianne. "Sustainable Development for Women and Children in Amazonia." Discussion paper prepared for UNICEF, January, 1991.

turn, these environmental stresses pose added threats to the well-being of the poor.²

The interests of one or more groups of inhabitants may conflict with the interests of other groups in an area where there is competition for access to and the use of scarce natural resources. Such conflict may become exacerbated as traditional natural resource management practices are questioned and alternatives are introduced. Some communities, such as Maraba in Brazil, rely on a limited economic base i.e., sawmills and ranching. Plans to change resource management practices in these areas are particularly constrained unless viable alternative income-generating enterprises are developed.

Since much of the Environmental/Global Climate Change (E/GCC) Program focuses on development and protection of forest and wildlife reserves, land tenure issues are an important factor in planning for management of such reserves. For example, the 800,000 acre Montes Azules Biosphere Reserve in the Selva Lacandona area in Chipas, Mexico has been a reserve since 1977, but people continue to use the land for slash and burn agriculture, logging, hunting, road building, oil exploration, and grazing. In many areas, population pressures result in the need for more productive land, which threatens buffer-zone areas. Extractive reserves may protect the economic interests of one group of inhabitants but place constraints on other groups. Private ownership may be challenged in some areas, or may potentially hinder efforts to introduce more ecologically sound management practices.

Governments of Brazil, Mexico and Central America have made statements regarding their commitment to Environmental Issues and policy reform related to natural resource management, but in Brazil and Mexico, state governments are important players on policy matters since land tenure and use are often controlled by the state. Policy analysis must proceed with careful coordination with both state and national government institutions related to issues of commonly-held land, reserves and private ownership.

Projects are already funded under the E/GCC and some activities have begun; therefore, beneficiary participation in the development of projects to date was dependent on the extent to which particular groups submitting proposals collaborated with local groups and individuals as proposals were developed. A review of all funded proposals and existing plans of work shows that proposal writers were knowledgeable about the social-

²Leonard, H. Jeffrey. "Environment and the Poor." in Environment and the Poor: Development Strategies for a Common Agenda. Overseas Development Council, Washington, D. C., 1985.

cultural context of the region in which they intend to work and in fact, have well-established links to local organizations and individuals and have identified local professionals to work with their projects.

The existing projects provide for socio-economic studies in project areas and rely heavily on working with NGOs and other community groups, such as municipal governments. Community-based groups, including NGOs do exist in the program areas of all countries, some with more experience and sophistication in natural resource management than others. The E/GCC Program should provide a means for coordination and dissemination of lessons learned among participating NGOs. This can be accomplished through pamphlets, meetings and seminars.

In addition, projects in Brazil, Mexico, and Central America plan to incorporate community-based extension efforts related to production and forest extraction, marketing, ecotourism and natural resource management. Community-based environmental education programs are also planned. These efforts provide an opportunity to integrate local men and women from different groups into planning and implementation of project activities. Local populations must be consulted as program activities move forward.

Based on program level objectives, common elements exist across the "key" countries of Brazil, Mexico, and Central America. Therefore a framework for assessment and tracking of common elements of the social-cultural context can be developed. Figure 1 identifies the program elements for which design, implementation, impact and sustainability are most likely to be influenced by social-cultural variables, and which have important implications for participants and beneficiaries.

The direct beneficiaries of each of these efforts will be the rural and indigenous poor who directly use forest resources. The benefits will be enhanced if the project-level activities give careful consideration to the representation and inclusion of all rural groups, including forest and non-forest dwellers; men, women, and children; and different cultural and economic groups.

Because the program elements referred to above are interrelated and will be implemented by various contractors or grantees in several countries, there is an opportunity to add to the general knowledge base about social-cultural factors and environmental issues and to maximize the overall positive impact and sustainability of the Environment/Global Climate Change Project by approaching the social soundness analysis of the project as a dynamic process. This can be achieved by identifying a minimum number of guidelines and questions related to project-level activities for the 10 project elements in Figure 1. Resulting

information should be collected in a format which can feed in to a project-wide information system, first at the country level, and then for the entire program.

A thread which runs through several of the project elements is a reliance on community-based planning, decision-making and action. Activities which involve community resources should use similar methods for community assessment, including a key set of social-cultural variables such as age, sex, economic livelihood of community members, community group membership, leadership patterns and existing communication channels. This information can be usually be obtained from existing sources or through "quick and dirty" data collection. In some instances, research studies are already planned as part of project activities.

Social-cultural factors should be carefully integrated into criteria for "sustainable" natural resource management practices. An important consideration is whether the benefits of sustainability outweigh the costs, in both social and economic terms. Again, the variety of activities in this project provide an important opportunity for comparison across regions and countries.

Policy analysis and dialogue efforts, including the strengthening of NGO capability to participate in and influence the policy process, should include a focus on the potential differential impact of some policies on various groups. One example is the impact of land tenure policies on forest and non-forest dwellers or males and females.

Logging companies, electric utilities, industrial and commercial consumers of energy, NGOs, and government agencies will also participate and benefit in this project. These benefits should be designed and implemented with consideration to constraints faced by the rural and indigenous poor who are the primary beneficiaries.

Because USAID staff in Mexico and Brazil are minimal and special activities in other countries will rely heavily on other projects such as RENARM, administrative coordination to ensure programmatic planning may be difficult. The E/GCC Program should establish committees to review proposals and yearly plans of work. These committees should require a social analysis component in all new proposals and a social analysis based on experience to date in yearly plans of work for on-going projects. Monitoring and evaluation systems established for the E/GCC should include social-cultural data for all activities. Consideration should be given to special studies analyzing social-cultural data at the program level at yearly intervals, including both qualitative and quantitative information.

FIGURE 1

COMMON ELEMENTS AMONG COUNTRIES

<u>Program Activities:</u>	<u>Brazil</u>	<u>Mexico</u>	<u>Central America</u>
1) community-based management of natural resources	sustainable use of Amazonian resource extractive reserves	management of tropical forests- buffer-zone management objectives	Programme for Belize PEM/PM
2) capacity building of local NGOs	sustainable use of Amazonian resources extractive reserves/ environmental policies- institutional strengthening	institutional strengthening & human resources development	regional collaboration
3) development of small and micro-enterprises	sustainable use of Amazonian resources extractive reserves	management of tropical forests - buffer-zone management	
4) ecotourism	sustainable use of Amazonian resources- extractive reserves	management of tropical forests - ecotourism	

FIGURE 1

COMMON ELEMENTS AMONG COUNTRIES*

<u>Program Activities:</u>	<u>Brazil</u>	<u>Mexico</u>	<u>Central America</u>
5) research on sustainable forest management alternatives, including the collection and processing of extractive resources	sustainable use of Amazonian resources- extractive reserves, agroforestry/sustainable agriculture, pasture rehab	management of tropical forests - socio-economic surveys and basic studies	
6) establishment of protected areas	sustainable use of Amazonian resources- extractive reserves	management of tropical forests - extractive reserves	Rio Bravo Conservation Area/collaboration with USAIDs and ROCAP
7) improved community outreach through extension	sustainable use of Amazonian resources- extractive reserves	management of tropical forests - collaboration with USAIDs and ROCAP	
8) decreased use of fossil fuels	energy efficiency	energy - technology transfer/energy planning	
<u>Program Activities:</u>	<u>Brazil</u>	<u>Mexico</u>	<u>Central America</u>

*identified from the PID

FIGURE 1

COMMON ELEMENTS AMONG COUNTRIES*

9) environmental
education

environmental
policies,
planning, and
management-
environmental
assessment
capabilities/
linked to
environmental
education

training and
environmental
education for
local inhabitants

Programme for
Belize/public
education

10) improved
policy dialogue,
analysis, design,
and implementation

environmental
policies,
planning, and
management/natural
resource policies
& economics/
institutional
strengthening

Policy
formulation/
training,
workshops,
seminars, and
policy analyses

TRAINING PLAN

ENVIRONMENT/GLOBAL CLIMATE CHANGE PROJECT (E/GCC)

I. Program Goal

In support of the E/GCC goal of helping to reduce greenhouse gas emissions, training will be provided in a number of technical areas to rural residents, and appropriate staff of government agencies and NGOs in Brazil, Mexico, and Central America.

II. Program Purpose

The training will directly support the E/GCC purpose of helping to develop and adopt policy reforms, and develop and disseminate technologies and practices that will result in the sustainable and efficient use of forest and energy resources. The training will consist of short-term training courses, seminars and workshops, targeted at those members of government and the community who are well positioned to influence positively the level of greenhouse gas emissions in the targeted project countries.

III. The Training Process

Effective training programs contain a series of discrete steps which collectively comprise the "training process". The E/GCC project staff will work to insure that this process is incorporated into all training programs.

Training Process

- 1) **Diagnose Needs:** deemed critical to assure that training requirements support project objectives. Need determinations are made by comparing the existing knowledge of prospective trainees with what they should know to affect change in a direction supportive of the project.
- 2) **Set Goals:** determine what you expect trainees to be able to do following training.
- 3) **Develop Strategy:** select training techniques, training media, a training site, preparing lesson plans and evaluation instruments. This strategy will be formulated within the context of the existing institutional, policy and economic environment.
- 4) **Conduct Training:** utilize the most effective training approach, i.e. course, workshop, or seminar.
- 5) **Evaluate Training:** determine whether learning has taken place immediately after training. This will be done through a combination of oral and written exams and group feedback sessions.

- 6) **Observe Training Graduates in their Work Setting:** determine whether the training has caused individual and/or organizational behavior to change positively.
- 7) **Gather Feedback to Redesign the Training:** based on the evaluations conducted in steps 5 and 6, determine whether the training program needs to be altered.

IV. Training Methodology

Training under the E/GCC will incorporate a number of proven approaches and techniques to improve the prospects for learning. These include:

- a. Competency-based instruction: Where appropriate, this method of instruction will be employed. Competency-based instruction (CBI) is most commonly found in vocational training programs. The CBI method has many advantages, including a built-in set of learning standards as trainees must prove themselves competent in each discrete task element of a trade before they can graduate from the course. This method also permits learning to be individually based, progressing at the pace of each trainee. For the E/GCC project, this method of instruction will be most applicable for the technical training in sustainable agriculture provided to rural residents.
- b. Problem-Solving: The attainment of new skills and knowledge will be achieved by requiring trainees to address real life problems. The use of situational exercises will help keep the training job-oriented and place learners in active and stimulating roles.
- c. Experiential Learning: On the job training tends to be the most effective modality for upgrading skills, far more effective than classroom training. Accordingly, training will emphasize "hands on" field work, where appropriate.
- d. Training of Trainers: The most cost-effective and sustainable approach to training is to conduct training of trainer courses. The development of a cadre of knowledgeable and competent training specialists is essential for conducting training at so many different educational levels and in such a diverse array of subjects. Such courses will also help to standardize locally a systematic approach to the delivery of training.
- e. Emphasis on Local Training: Where feasible, training will be conducted in the host country. Locally based training has the advantages of being less costly, language compatible, and provides greater opportunities for experiential learning.

V. Program Outputs

A. Training Needs Assessment

The project will assess the training needs of individuals and organizations to assure that training requirements resolve organizational problems and achieve project objectives. These assessments will also provide essential material for developing training goals and plans. Such assessments are currently being conducted in Brazil and Mexico.

1. Brazil - Jau National Park Buffer Zone and Amapa Extractive Reserve
 - a. A socioeconomic and resource-use survey will be conducted to identify appropriate sustainable economic alternatives for rural residents of the two areas. From this, training activities will be developed to provide residents with the knowledge and skills to engage in sustainable development.
 - b. An economic analysis will be undertaken on the uses of palms for food and for other uses including domestic utensils, clothing, beverages, cosmetics, tools, weapons, fishhooks, and construction materials. From this, extension materials and training activities for will be developed for local residents.
2. Mexico - Calakumul Biosphere Reserve Buffer Zone, Chimalpa region of Oxaca, El Ocote Ecological Reserve, and El Triunfo Biosphere Reserve
 - a. A Participatory Rural Appraisal (PRA) will be employed to identify the most critical impediments to sustainable use of natural resources and the current activities most damaging to the forest. Once this data is collected it will be possible to develop a plan of training activities for removing the identified impediments. Expected training activities include the promotion of agroforestry, intensive pasture management for existing cattle, bio-intensive gardening and natural forest management.
3. All Other Project Components Involving Training
 - a. Informal assessments will be carried out for other training activities on an as needed basis.

B. Identified Training Activities

1. Brazil
 - a. Increasing the Effectiveness of the Environmental Impact Assessment (EIA) Process (World Wildlife Fund

- Grant) - Training will be provided to NGOs and environmental agencies in two states to define criteria for EIAs related to forest use and deforestation, strengthen capacity of government staff to analyze and utilize EIA reports, and increase public participation in the EIA process.**
- b. Natural Resource Economics (WWF) - Courses and workshops will be offered to government officials in applied ecology and natural resource economics to improve their ability to incorporate environmental considerations into economic analyses and decisions related to natural resource use in the Amazon region.**
 - c. Institutional Strengthening (WWF) - Training will be provided to appropriate NGOs in proposal design, financial management and human resources development.**
 - d. Management of Protected Areas and Their Buffer Zones in the Amazon (WWF) - Environmental education will be provided to children and adult residents of the Jau National Park buffer zone; and management training will be provided to community members for administering the Amapa Reserve and local economic enterprises, such as processing plants.**
 - e. Development of Alternative Small-Scale Natural Forest and Agroforestry Production Systems (Univ. of Florida Grant) - Training in apiculture will be provided by a project created apiculture training and research center to farmers residing nearby the Sao Paulo Luiz de Remanso Extractive Reserve.**
 - f. Forest and Fire Management (USDA Forest Service) - Training in the management of forest fires and forest systems will be provided to appropriate government officials.**
 - g. Environmental Impact Assessments (EPA) - Training will be provided to Brazilian Federal and State agencies responsible for evaluating EIAs.**
 - h. Research Methods (PPC/WID GENESYS Project) - Up to 6 workshops will be held at project field locations to strengthen the skills of local social scientists to assure that social issues are incorporated into the collection and analysis of project related data.**
 - i. Environmental Law Institute Grant - Training in environmental impact assessments will be provided to local NGOs and governments agencies.**

2. Mexico

- a. **Parks-in-Peril Project (Nature Conservancy)** - Under a buy-in to this project, E/GCC will provide training courses and workshops in park and buffer zone management to appropriate NGO and government officials in 7 to 10 legally declared protected areas and their buffer zones.
- b. **Conservation of Biological Diversity Project (R&D/ENR)** - Under a buy-in to this project, E/GCC will provide training in areas identified in studies as critical to fostering sustainable forms of land use and economic development.
- c. **Debt for Nature Swap (Conservation International)** - In the Selva Laconda of Chiapas region, training will be provided to strengthen the capacity of national, regional, and local government agencies and NGOs to effectively manage reserves and buffer zones.
- d. **Energy Policy Development and Conservation Project (R&D/EY)** - Under a buy-in to this project, E/GCC will conduct a workshop on Integrated Resource Planning, focusing on the environmental and economic benefits of demand-side management, and will introduce state-of-the-art utility planning methodologies.
- e. **Energy Training Project (R&D/EY)** - Under a buy-in to this project, E/GCC will train relevant government and private sector organizations in a number of energy related areas, examples of which include: environmental policy and implementation; energy planning and policy; refinery energy conservation; solar electricity technology; clean coal technology; coal utilization technologies; stationary source air pollution monitoring; air pollution control technology; data utilization and management; and management of electrical utilities.
- f. **Improved Environmental Planning and Management (Fundacion Universo Veintiuno Grant)** - Will provide training to municipal and community organizations in environmental planning and management and environmental impact assessments.

3. Central America

- a. **Rio Bravo Conservation and Management Area (Cooperative Agreement with Program for Belize)** - Guards will receive security training to reduce the poaching of timber and wildlife in the Rio Bravo area.

VI. Monitoring and Evaluation

Monitoring and evaluation (M/E) of the training will be done on two levels. At the micro level, trainees will be evaluated periodically by instructors using different testing instruments to determine their degree of learning and skill competency.

At the macro level, all E/GCC training programs will be evaluated during the mid-term and final evaluations of the overall project to insure the following: 1) the training fully supports the goal and purpose of the project; 2) learning is taking place; 3) the groups targeted for training are appropriate; 4) the number of individuals trained is sufficiently large to have a significant impact on helping to reduce the emission of greenhouse gases; 5) women represent a significant number of trainees; and 6) trainees are applying their newly acquired knowledge and skills.

TRAINING:GRussell:4-24-92(revised 7-14-92)

ANNEXES

- A. Logical Framework
- B. Descriptions of Ongoing and Proposed E/GCC Activities:
 - a. FY '90 & '91 Mexico Activities
 - b. FY '90 & '91 Brazil Activities
 - c. FY '90 & '91 AID/W-Special Activities
 - d. Proposed for FY '92 Funding
- C. Initial Environmental Examination (in LAC/DR/E files)
- D. Mexico Global Climate Change and Environmental Workplan 1990-92 (in LAC/DR/E files)
- E. Brazil Global Climate Change Strategy Paper (in LAC/DR/E files)

ANNEX A
Project Design Summary
Logical Framework
Environment and Global Climate Change Program
598-0784

Life of Project: US\$29.8 million
PACD: 9/30/94
Date Prepared: 7/20/92

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS																																				
<p>GOAL: Help Reduce Greenhouse Gas emissions in "key" countries of the LAC Region</p>	<p>1. Reduced rates of deforestation in selected sites. 2. Increased use of energy efficiency and renewable energy options by selected communities and companies. 3. Improved standard of living for local people, and increased profits for companies due to the sustainable and more efficient use of forest and energy resources.</p>	<p>1. Satellite data, on the ground surveys, etc. 2. Energy audits and surveys measuring use of efficient and renewable energy technologies. 3. Economic Surveys of communities, companies, specified regions.</p>																																					
<p>PURPOSE: Assist in the development and adoption of policy reforms, technologies, and practices that will result in the sustainable and efficient use of forest & energy resources</p>	<p>EOPS: 1.1 Host Government deliberations influenced by the forest and energy policy reforms developed from the program's analyses, pilot activities, and institutional strengthening. 1.2 Over 10 million hectares of tropical forest managed effectively under extractive/biosphere reserve models. 1.3 Energy and forestry practices accepted by target government and private users as economically profitable.</p>	<p>1.1 Surveys and Gov. records. 1.2 Site inspections, and local communities income derived from reserves. 1.3 Economic/market surveys, energy audits, etc.</p>	<p>1.1 Policy reforms are made and implemented. 1.2 Sustainable and more efficient use of forest and energy resources gain wide acceptance and spread to other users .</p>																																				
<p>OUTPUTS: 1. Institutions strengthened for influencing policy, planning, and management of forest resources. 2. Government officials educated about E/NR management and economic policy issues. 3. Pilot demonstrations and development of sustainable uses of forest resources. 4. Energy efficiency and renewable energy technologies and planning methodologies provided to target Government and private entities. 5. Monitoring & Evaluation Program Established</p>	<p>Output Indicators: 1.1 Seminars, training, and studies conducted. 1.2 25 NGOs strengthened for influencing policy. 1.3 Workshops, seminars, and public meetings for the development, dissemination, adoption of policy options and Env. Assessment Criteria. 2.1 Workshops, seminars, and studies, conducted. 2.2 Meetings of leading host country and international economists and resource managers with host country policy-makers. 3.1 20 pilot activities completed that demonstrate/develop sustainable and profitable logging, agroforestry, and extractive practices. 3.2 NGOs strengthened for testing, and disseminating sustainable practices. 3.3 Assessment of ecotourism potential in two regions and an ecotourism/environmental NGO functioning effectively. 4.1 Energy technology transfer through seminars, policy analysis, energy audits, and in-country and U.S. based training. 4.2 Energy Efficient and renewable energy options adopted by target government and private entities. 5.1 M & E methodology established and performance data being collected.</p>	<p>1.1 Site inspections Training records 1.2 Audit of NGOs' finance, management, and planning capabilities. 1.3 Survey of the impact of EAs and policy reforms on resource use. 2. Training records Interviews 3.1 Site inspections. 3.2 Audits of NGOs' management, planning and financial capabilities. 4.1 Audit of NGO's management, project implementation, and financial capabilities. 4.2 Site inspections and training records.</p>	<p>1.1 NGOs and Gov. agencies will adopt new methodologies. 1.2 Cooperative relationship between NGOs and governments continues and expands. 2.1 E/NR concerns remain politically forceful issues. 3. Local communities, timber companies, etc. will adopt new methodologies and economic activities. 4. Cost of fossil fuels remains high enough for conservation and increased efficiency to be economically attractive.</p>																																				
<p>INPUTS:</p>	<table border="1"> <thead> <tr> <th colspan="4" data-bbox="538 1793 1020 1841">Budget (US\$000):</th> </tr> <tr> <th data-bbox="538 1841 687 1888">AID</th> <th data-bbox="687 1841 852 1888">OTHER</th> <th colspan="2" data-bbox="852 1841 1020 1888">TOTAL</th> </tr> <tr> <th data-bbox="538 1888 687 1936">\$000</th> <th data-bbox="687 1888 852 1936">\$000</th> <th colspan="2" data-bbox="852 1888 1020 1936">\$000</th> </tr> </thead> <tbody> <tr> <td data-bbox="538 1936 687 1961">Sust. Forest Use</td> <td data-bbox="687 1936 852 1961">22,589</td> <td data-bbox="852 1936 1020 1961">12,500</td> <td data-bbox="1020 1936 1533 1961">35,089</td> </tr> <tr> <td data-bbox="538 1961 687 1987">Energy</td> <td data-bbox="687 1961 852 1987">1,583</td> <td data-bbox="852 1961 1020 1987">3,400</td> <td data-bbox="1020 1961 1533 1987">4,983</td> </tr> <tr> <td data-bbox="538 1987 687 2013">Policy/Economics</td> <td data-bbox="687 1987 852 2013">3,485</td> <td data-bbox="852 1987 1020 2013">2,800</td> <td data-bbox="1020 1987 1533 2013">6,285</td> </tr> <tr> <td data-bbox="538 2013 687 2039">Project Support</td> <td data-bbox="687 2013 852 2039">1,305</td> <td data-bbox="852 2013 1020 2039"></td> <td data-bbox="1020 2013 1533 2039">1,305</td> </tr> <tr> <td data-bbox="538 2039 687 2065">M & E</td> <td data-bbox="687 2039 852 2065">800</td> <td data-bbox="852 2039 1020 2065">600</td> <td data-bbox="1020 2039 1533 2065">1,400</td> </tr> <tr> <td data-bbox="538 2065 687 2102">Total</td> <td data-bbox="687 2065 852 2102">29,762</td> <td data-bbox="852 2065 1020 2102">19,300</td> <td data-bbox="1020 2065 1533 2102">49,062</td> </tr> </tbody> </table>			Budget (US\$000):				AID	OTHER	TOTAL		\$000	\$000	\$000		Sust. Forest Use	22,589	12,500	35,089	Energy	1,583	3,400	4,983	Policy/Economics	3,485	2,800	6,285	Project Support	1,305		1,305	M & E	800	600	1,400	Total	29,762	19,300	49,062
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**Environment/Global Climate FY '90 & 91
Funded Activities in Mexico**

A. Calakmul Biosphere Reserve - To date (FY '90 & '91) \$254,000 of a \$350,000 three year grant has been provided to the Mexican private environmental group, PRONATURA. The funds are being used to consolidate and manage the Calakmul Biosphere Reserve. Activities focus on inventory and baseline studies, community outreach targeted in and around the Reserve, protection of core areas, introduction of economic alternatives, and promotion of the Reserve on the regional, national and international level. Outside of this grant A.I.D. provides additional funds to PRONATURA through WWF and the TNC Parks-in-Peril Project.

B. Parks-in-Peril - An FY-91 grant of \$528,000 with The Nature Conservancy (TNC) will provide funds to assist Mexican agencies in the management and protection of seven to ten parks in peril in Mexico. The funds will be obligated as an "add-on" to the Cooperative Agreement with TNC under the LAC Regional Parks-in-Peril project and will cover project costs for the first year of a three-year effort. Additional A.I.D. support is expected to bring the LOP funding level to \$1,654,000.

C. Management of Northern Border Wildlands - \$160,000 has been granted to the World Wildlife Fund to support the development and implementation of pilot buffer zone management projects in Mexico. In its first phase this program supports buffer zone management in one to three forested wildlands located along the northern border region of Mexico. Major project components include operational and master planning, baseline studies, institutional strengthening of Mexican conservation NGOs, inter-institutional collaboration, and buffer zone and core management. A.I.D. expects to expand this program to cover additional border wildlands in FY '93 and future years.

D. Community Development Pilot Projects - To date, \$1,300,000 has been provided to support project activities of the World Wildlife Fund in southern Mexico, with an approach similar to that described above (paragraph "C" for Northern-Border Wildlands). These funds will provide for the first two years of a five-year effort. Total A.I.D. funding is estimated at \$3,705,000.

E. Debt for Nature Swap - A grant to Conservation International has provided \$355,000 to partially finance Mexico's first ever debt-for-nature-swap. The funds will be used to strengthen several Mexican environmental institutions, mobilize non-A.I.D. resources within Mexico and the U.S., and contribute to policy reform. A major element of the activity involves the protection and management of the Lacandon Forest and Montes Azules Biosphere Reserve in Chiapas. A Biological Resources Data

Bank and Geographic Information System is being developed in a Mexican organization (UNIRBMEX) within the National University of Mexico. Additional A.I.D. funding is expected.

F. Energy Program - The energy component of the E/GCC program in Mexico is being implemented through two A.I.D. projects designed to reduce the release of carbon dioxide, a principle global warming gas, from the combustion of fossil fuels. The first project focuses on end-use energy efficiency improvement, load management, and institutional and management development. The second project, a buy-in to the R&D Energy Training Program (ETP), assists Mexican counterpart organizations (government and private) in strengthening through training of professional personnel working in the energy and environment sectors. During FY-91, a total of \$433,000 was obligated for the energy component. Additional funding is expected.

H. Improved Environmental Planning and Management: This activity has two components, initiated in FY '90 that will continue over the next four years. Through FY '92 a total of \$174,330 has been granted, and additional A.I.D. funding is expected. The activity is carried out by the Mexican private environmental group, Fundacion Mexicana para la Educacion Ambiental (FUNEA) (previously known as Fundacion Universo Ventiuono). The first component focuses on the development of an improved policy and legal framework to help prevent deforestation and mitigate global climate change. Through development of technical information, studies, and workshops FUNEA expects to strengthen the capacity of municipal and local governments and conservation organizations for environmental planning and management. A second component helps to facilitate technical exchange and training programs between the U.S. and Mexico in areas such as policy reform, environmental impact assessment and mitigation, and improved environmental planning.

I. Training - \$200,000 was provided in FY '91 for environmental training of Mexicans in direct support of A.I.D.'s E/GCC objectives. Examples of areas in which training will occur include sustainable forest management, protected-areas management, and natural resource economics and policy. Training in the energy sector will be done through the Energy Training Program (described in paragraph F above). Additional A.I.D. funding is expected in FY '92.

J. GCC Advisor - To date, \$462,000 has been provided for the services of an environmental advisor to assist the A.I.D. office in Mexico in the design and implementation of the E/GCC program. Continuation of the GCC position is expected in future years.

**Environment/Global Climate Change FY '90 & 91
Funded Activities in Brazil**

Below are descriptions of each of the E/GCC Brazil components that received funds in FY '90/'91.

1. Improving the Environmental Impact Assessment (EIA) process.

Technical experts and state government environmental regulatory agencies will be brought together to develop technical guidelines for preparation and evaluation of environmental assessments for forest clearing and other forest exploitation activities. This work will be linked to environmental education and dispute resolution activities in order to promote active public participation in environmental decision making.

2. Extractive Reserve Promotion in Amapa

Extractive reserves have received widespread acclaim as a socially and environmentally sound development alternative for Amazônia. While several major donors are focusing support on the development of viable extractive reserves in Acre, the state of Amapá has similar potential but negligible donor support. WWF will work with grassroots NGOs to initiate community organization, land tenure studies, and forest resource assessments which are necessary precursors to large-scale establishment of extractive reserves in this region.

3. Promoting ecotourism, wildlife research and environmental education in the Amazon

Amazonas, Brazil's largest state in the Amazon, lacks a powerful environmental NGO. Fundacao Vitoria Amazonica (FVA), a new wildlife management, environmental education, and ecotourism organization, has the potential to fill this need. WWF will assist FVA in defining a program of environmental education and ecotourism that establishes FVA's credibility, builds financial self-sufficiency, and links FVA to other environmental organizations and institutions in the Amazon.

4. NGO strengthening to increase their influence on policy.

NGOs have played a key role in raising public awareness and establishing a political environment wherein environmental considerations have become a key component of government decision-making. However, the potential of Amazon-based NGOs to interface with government research agencies, carry out demonstration field projects, and play a positive role in the policy process, has been

limited by their low level of funding, planning, and training. By providing training, assistance in management, and basic infrastructure needs, WWF will help these institutions become more effective in influencing policy.

5. Support to SEMAM (and IBAMA) for strategic planning and policy development

A small fund will be made available to the upper management of Brazil's national environmental agency, the Special Environment Secretariat (SEMAM), and its implementing arm, the Brazilian Institute for Environment and Renewable Natural Resources (IBAMA), to support costs of travel and technical assistance for strategic planning and policy development. Activities will be of two types: consultations with a wide range of technical experts and interest groups on policy issues; and strategic planning for the agencies themselves to become more capable of effectively managing large-scale funding from bilateral and multilateral donors.

6. Policy analysis and action grants

This component will promote a broader understanding of those activities resulting in environmental degradation, the legal mechanism for control of these activities, and viable economic alternatives. Grants will be made for the analyses of current natural resource policies. Implementation will be through a Belem-based Policy Analysis and Action Steering Committee, made up of key technicians, scientists, researchers, writers, lawyers, and educators involved in environmental issues.

7. Natural Resource Economics

The degradation of the resource base is but a symptom of more fundamental problems; most prominent among these are economic policies that inadvertently encourage or permit the inefficient, wasteful, or destructive use of the resource base. WWF working with Brazilian counterparts will design a workshop for Brazilian civil servants responsible for addressing natural resource economic issues in Brazil's 35 federal agencies. Also supported will be economic and policy studies conducted jointly by Brazilian and leading international environment/natural resource economists.

8. Agroforestry Development Program for Small Producers in the State of Acre

The University of Florida at Gainesville will assist a consortium of institutions, PESACRE, to carry out a three-year program of

substantive research and extension activities. The program seeks to develop and implement alternatives for diversifying small-scale agriculture and agroforestry production systems in sustainable ways, in order to: contribute to higher levels of income and improved quality of life for rubber tappers, agriculturalists and Indians; permit stable settlement patterns for rural populations; reduce the negative environmental impact of production activities; reduce social pressures in urban centers; and strengthen the technical and institutional basis for the formulation of agrarian policies that can reduce pressures for deforestation in the State of Acre.

9. USDA/Forest Service

A one-year, \$267,000 PASA with the USDA Forest service will provide funds for research on fire and sustainable forest management.

10. Environmental Protection Agency

A one-year, \$50,000 PASA with the EPA will provide funds for environmental impact assessment with particular focus on the impacts associated with forest clearing and energy development. The EPA, the U.S. Forest Service, and the World Wildlife Fund will work with Brazilian state and federal agencies to improve the environmental impact assessment process.

11. Gender Issues in Sustainable forest use

This is an 18-month activity jointly funded by PPC and LAC. The total project cost is \$744,691 of which LAC will provide \$296,000 and the remaining \$448,691 will be provided by PPC. A review of the planned activities for the E/GCC program identified components for which integration of women in development (WID) is key to optimal program development. A buy-in to the PPC/WID centrally funded project will provide technical assistance and other resources to facilitate full integration of WID into the program. Funds will also be provided for a study of labor generation through managed use of the forest and forest products.

12. Environmental Law Institute - A one-year, \$121,000 grant to the Environmental Law Institute (ELI) will provide technical assistance in developing environmental policy in Brazil in support of the E/GCC program. ELI will work closely with the World Wildlife Fund and the University of Florida to identify and provide the legal technical assistance to support their activities in two key areas: institutionalization of extractive reserves, and assistance in developing and delivering environmental training courses. In addition, ELI will assist in identifying additional needs for legal and policy assistance.

13. Training - Through the Advanced Development Training Program \$200,188 will be obligated to provide training in direct support of E/GCC objectives. Examples of areas in which training may occur include sustainable forest management; least-cost energy planning and management, particularly energy efficiency and renewable energy; and natural resource economics and policy.

Environment/Global Climate Change FY '90 & '91
Funded AID/W-Special Activities

1. Mbaracayu Nature Reserve Program: Matching Grant to The Nature Conservancy

A.I.D. has made a \$500,000 matching grant to the Nature Conservancy to support the establishment and long-term protection of the 143,000 acre Mbaracayu Nature Reserve in eastern Paraguay. TNC will match A.I.D. funds with an additional \$2.25 million, and use the total \$2.275 million to purchase qualified Paraguayan debt for a debt-for-nature swap to finance the acquisition of the Mbaracayu, establish Mbaracayu as a core area of a sustained development program, and endow a management trust fund for the reserves' long-term protection. The Mbaracayu tract is covered by a virgin forest of rich biodiversity, the last large single ownership of dense humid sub-tropical forest in southern Latin America. Present are endangered plants and animals; a vestige of the unique "Mata Atalntica" of Brazil, now 93% destroyed. It is also important as the traditional hunting and gathering area of a large group of indigenous Ache which has been forced to move to settlements as the forest is destroyed.

2. Environmental Training Program

Under the Global Climate Change Initiative, A.I.D. has been directed to "increase the number and expertise of personnel devoted to end-use efficiency, renewable energy, and environmental activities in all bureaus and missions," and to "devote increased resources to technical training of mission directors, in energy planning, energy conservation, end-use energy efficiency, renewable energy, reforestation, and biodiversity." To meet this Congressional Directive the LAC Bureau provided \$146,330 of FY '90 funds, in conjunction with buy-ins from other regional Bureaus and S&T, for a three year contract to design, implement, and manage an energy and natural resource management training program developed by the PFM/PM Training Division.

3) Rio Bravo Conservation and Management Project

In FY '91 A.I.D. anticipates providing over three years a total of \$1.5 million, which will be combined with \$1.94 million from the Massachusetts Audubon Society, The Nature Conservancy, and other external international organizations, to assist in purchasing 110,000 acres of prime forest land in the Rio Bravo area of Belize. This activity is part of the "Programme for Belize," a larger, country-wide program of land conservation, environmental protection, economic development, ecological tourism, training, and public education for Belizean nationals.

Rio Bravo is one of three large adjacent reserves in Belize,

Guatemala, and Mexico for which A.I.D. is supporting the development and management. The other two reserves are the Maya Biosphere Reserve in the Peten of Guatemala, and the Calakmul Biosphere reserve in Southern Mexico.

Reportedly there is interest at high levels in joining the three reserves to form a tri-national peace park. Potential benefits to this include: (1) setting an example for inter-governmental cooperation in the region; (2) attracting greater support from international donors and NGOs; (3) attracting more ecotourists while complementing and promoting "Ruta Maya," the tourist development plan of cooperation amongst countries with significant Mayan archeological sites and natural beauty.

Environment/Global Climate Change Activities
Proposed for Funding in FY '92

I. Mexico

A. Calakmul Biosphere Reserve - An amendment to the grant with PRONATURA will provide \$75,000 to continue the consolidation and management of the Calakmul Biosphere Reserve. Activities focus on inventory and baseline studies, community outreach targeted in and around the Reserve, protection of core areas, introduction of economic alternatives, and promotion of the Reserve on the regional, national and international level.

B. Environmental Planning and Management - Funding under E/GCC for the Environmental Planning and Management activity with the Mexican Foundation for Environmental Education ("Fundacion Mexicana para la Educacion Ambiental" - FUNDEA), previously the 21st Century Foundation ("Fundacion Universo Veintiuno" - FUV) began in FY '90 with a grant of \$99,330. FY '92 funding of \$34,850 will be the second allotment. The funds are being used to develop an improved policy and legal framework that will help prevent deforestation and mitigate climate change in Mexico. Also, through the development of technical information, studies, and workshops under this project, FUNDEA expects to strengthen the capacity of municipal and local governments, and of conservation organizations for doing environmental planning and management.

C. Debt-for-Nature Swap - A grant amendment for \$165,150 will build upon FY '90 and '91 funding to Conservation International (CI). The grant co-funds CI's debt swap with the Government of Mexico. The resulting increased funds are used to strengthen several Mexican counterpart institutions, to mobilize non-A.I.D. resources within Mexico and the U.S., and to promote policy reform. The core element of the activity involves the protection and management of the Lacandon Forest in Chiapas, and the forest's core zone, the Montes Azules Biosphere Reserve. A Biological Resources Data Bank and Geographic Information System will also be developed within the Mexican organization, UNIRBMEX.

D. Parks-in-Peril - An FY-92 obligation of \$558,000 with The Nature Conservancy (TNC) will provide funds to continue TNC assistance to Mexican agencies for the management and protection of seven to ten parks in peril in Mexico. The funds will be obligated as an "add-on" to the Cooperative Agreement with TNC under the LAC Regional Parks in Peril project. In FY '91 \$528,000 of E/GCC funds were obligated for this effort.

E. Silvo-Pastoral Demonstrations: An FY '91 obligation of \$25,000 under the ITT project initiated a three year activity with a total LOP of \$75,000. E/GCC will provide the remaining \$50,000 with \$25,000 obligations in FY '92 and '93. The project will implement demonstration plots in the Zongolica and Chiapas

mountain areas to instruct local residents in a silvo-pastoral and reforestation system. The system increases land productivity while protecting natural resources through responsible land management and reforestation. Part of the funds also supports training of local residents at the AGROSOL educational facilities to serve as local advisors and technical experts.

F. Environmental Policy Studies - An FY '92 obligation of \$165,000 for a grant to the Environmental Law Institute is the first year funding of a new activity with a planned LOP funding of \$405,000. ELI will provide assistance for investigating the prospects and developing strategies for reforming policies, laws, and institutions in order to improve forest management, protect priority parks and reserves, and promote sustainable development in the buffer zones of protected areas in which E/GCC is working. In a later phase of this activity, ELI will expand its focus to address the issues of reliance on and the inefficient use of fossil fuels.

G. Tropical Forestry Action Program - An FY '92 obligation of \$200,000 will be the first of three years of funding for an activity with planned LOP support of \$600,000. Funds will be used for a grant to the Miguel Aleman Foundation to strengthen, with a focus on southeastern Mexico, select elements of Mexico's Tropical Forestry Action Program. Major outputs expected include: natural forest regeneration and management projects; reforestation; sustainable agroforestry; tree nurseries established; non-timber product enterprises developed; sustainable forestry incentives developed; an improved tropical forestry data base and information system; research and training provided; and technical assistance for local groups provided.

H. Land-Use Monitoring and Research - A FY 1992 initial obligation of \$200,000 will be provided to support an Inter-Agency Agreement with the U.S. Environmental Protection Agency to assess land-use patterns, carbon cycling, and forest management options in southeastern Mexico in and around GCC-supported protected areas and buffer zones. This program is designed to enhance the monitoring and evaluation activities of the forest conservation component of the AID/M Global Climate Change Program, and to strengthen grantee capabilities for remote sensing and field assessments of land-use practices.

I. Renewable Energy Program - In FY '92, \$250,000 will be obligated under an Inter-Agency Agreement with the U.S. Department of Energy to support renewable energy development and commercialization in Mexico. Activities will include training, technical assistance, resource assessments, and other activities. Promoted will be proven renewable energy technologies in practical cost-effective applications including rural electrification, water pumping, solar and wind power development, and grid-connected bulk power generation. These activities will be undertaken as part of the Mexico-U.S. Renewable Energy Cooperation Program (PROCER).

J. ADC Training - Through the Advanced Developing Country Training Program, \$187,000 will be obligated to provide training in direct support of E/GCC objectives. Examples of areas in which training may occur include sustainable forest management, protected-areas management, renewable energy technology, and natural resource economics and policy. In FY '91 \$200,000 of E/GCC funds were provided for training.

K. GCC Advisor - \$140,000 will be obligated to continue the services of a personal services contractor to assist the A.I.D. Rep. in the design and implementation of the E/GCC program.

II. Brazil

A. World Wildlife Fund - This activity, begun in FY '90, has been lengthened from a planned four year to a five year activity, with the LOP funding increased from \$2.732 million to \$3.878 million. The \$875,000 planned for obligation in FY '92 will be the third year of funding and will bring the total obligated thus far to \$2.128 million. Through the grant the World Wildlife Fund (WWF) will contribute to reducing deforestation by working to: improve Brazil's environmental assessment capabilities; incorporate environmental considerations in economic analysis and decision-making related to natural resource use; strengthen conservation and environmental NGOs; and promote management of protected areas and their buffer zones. WWF will also have a role in encouraging technical coordination and networking among the grantees in the E/GCC Brazil Program.

B. University of Florida - A.I.D. entered into a three-year grant agreement in FY '90 with LOP funding of \$944,875. A \$318,765 amendment to the current grant will increase its LOP funding to \$1,263,640. The FY '92 obligation of \$410,000 is the third year of funding and will bring the total funds obligated to the new LOP level. Additional funding in FY '93 and '94 is expected. The University of Florida is assisting a consortium of institutions, PESACRE, to carry out a program of research and extension activities. The program seeks to develop alternatives to deforestation through the diversification of sustainable small-scale extractive forestry and agroforestry production systems.

C. USDA/Forest Service - An FY '92 obligation of \$300,000 will fund a PASA with the USDA Forest Service to work with Brazilian government agencies on improving fire control and sustainable forest management. This activity will continue and expand upon those begun last year by a PASA with Forest Service.

D. Environmental Law Institute - An FY '92 obligation of \$240,000 will provide support for the Environmental Law Institute

(ELI) to continue work begun with a grant to it in FY '91 of \$119,169. ELI is providing technical assistance for developing environmental policies in Brazil that support E/GCC objectives. ELI will work closely with the World Wildlife Fund and the University of Florida to identify and provide legal technical assistance to support their activities in two key areas: institutionalization of extractive reserves; and assistance in developing and delivering environmental training courses. In addition, ELI will assist in identifying additional needs for legal and policy assistance.

E. ADC Training - Through the Advanced Developing Country Training Program \$250,000 will be obligated to provide training in direct support of E/GCC objectives. Examples of areas in which training may occur include sustainable forest management; least-cost energy planning and management, particularly energy efficiency and renewable energy; and natural resource economics and policy. In FY '91 \$290,019 were obligated for training.

F. Cultural Survival Enterprises - An FY '92 obligation of \$265,000 will be the first of three years of support for Cultural Survival Enterprises, which will identify new forest products, processes, and markets; and explore market driven mixed-forestry systems with emphasis on agroforestry practices by forest dwellers in intact forest settings. Individual activities include: study of the history of currently traded non-timber forest products; analysis of health and safety information on selected products; development of improved harvesting and post-harvest handling techniques; and development of procedures for adding value locally, thereby strengthening local support for conservation.

G. GCC Support - \$10,000 will be obligated to support an assessment of possible environmental education activities to be developed by AID in the Amazon region of Brazil.

H. FNPSC GCC Advisor - \$60,000 will fund for an additional year a Foreign National personal services contractor who will assist the AID Rep. with the design and implementation of the E/GCC program in Brazil.

I. USPSC GCC Advisor - \$110,000 will fund for an additional year a U.S. personal services contractor who will assist the AID Rep. with the design and implementation of the E/GCC program in Brazil.

III. LAC/W Activities and Special Activities -

A. Monitoring and Evaluation - A buy-in of \$200,000 to the R&D PRISM project will provide technical assistance to USAID/Mexico, USAID/Brazil, and LAC/W for developing and refining

Monitoring and Evaluation Systems that will measure and report on the progress of the Agency's Global Climate Change Initiative in the LAC region.

B. Rainforest Trust Fund - A total of \$ 3 million was provided under the E/GCC program to meet part of the U.S. governments commitment of \$5 million to the trust fund of the G-7 Pilot Program for the Conservation of Brazilian Rainforests.

C. Rio Bravo Land Purchase - To meet the second of three yearly equal installments, \$500 thousand was provided for the purchase of land to add to the Rio Bravo Conservation and Management Area in Belize.