General Secretariat of the Organization of American States
Unit for Sustainable Development and Environment (USDE)
Natural Hazards Project

CATALOGUE OF PROJECTS COMPLETED AND IN EXECUTION RELATED TO NATURAL HAZARDS MANAGEMENT

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UNIT FOR SUSTAINABLE DEVELOPMENT AND ENVIRONMENT ORGANIZATION OF AMERICAN STATES

NATURAL HAZARDS VULNERABILITY REDUCTION MANAGEMENT ACTIVITIES EXECUTIVE SUMMARY

The Unit for Sustainable Development and Environment (USDE), formerly the Department of Regional Development and Environment (DRDE), supports OAS organs and member states in natural hazard management through policy and strategic action preparation, technical assistance, training and technology transfer. The USDE, based at OAS headquarters in Washington, D.C., has been involved in natural hazards vulnerability assessment and disaster mitigation activities in Latin America and the Caribbean since 1983. Reducing the vulnerability of economic and social infrastructure to natural hazards is part of the mandates to the OAS from the Summits of the Americas in 1994, 1996, and 1998, from OAS/General Secretariat Resolutions AG/Res. 1682 and 1755, and from the Permanent Council to the General Secretariat of the OAS (CP/RES. 546(834/90) and CP/RES. 593(922/92). Its activities also take place in the context of the International Decade for Natural Disaster Reduction (IDNDR), from the Inter-American Program for Sustainable Development, and in concert with the Declaration of Cartagena (1994), the Miami Congress on Disaster Reduction and Sustainable Development (1996) and the First and Second Inter-American Dialogue for Disaster Reduction (1997, 1998).

The objective of USDE's technical support is to avoid disasters through intervention in development planning and project formulation in order to reduce vulnerability to natural hazards. Specifically, the activities focus on:

1. Formulating policy and strategic action alternatives for member states at the national, regional, and hemispheric levels.

2. Making information on natural hazards more accessible to development planning and emergency response agencies.

3. Training planning technicians and decision-makers in hazard evaluation, vulnerability assessment, and risk reduction techniques.

4. Assessing natural hazards as part of ongoing environmental and natural resource evaluations, and development strategy documents.

5. Identifying and formulating mitigation measures for development investment projects.

Activities are generally carried out as part of ongoing technical cooperation programs of the USDE at a national or regional level, collaborating with national and regional institutions. The activities are developed with the support of OAS member state agencies and international development assistance agencies, including the Global Environmental Facility (GEF), the European Community Humanitarian Office (ECHO), United Nations Development Programme (UNDP), Office of Coordination for Humanitarian Affairs (DHA) of the United Nations, Inter-American Development Bank (IDB), World Bank and bilateral development assistance agencies. With a focus on long term prevention and mitigation, USDE activities are complementary to emergency relief actions.

The USDE has undertaken a series of sector-specific vulnerability reduction studies at a national level for agriculture, education, energy, transportation, tourism and urban lifelines. Recognizing the central theme of the IDNDR, the objective is to prepare disaster

reduction programs to protect economic and social infrastructure as part of national sustainable development plans and programs. These studies are complemented by regional and national courses on the use of natural hazards information in the preparation of investment projects, and in vulnerability reduction programs.

The USDE is currently in charge of the coordination and follow-up of the Plan of Action proposed by the Summit Conference on Sustainable Development in the Americas held in Santa Cruz, Bolivia, in 1996, the implementation of the Inter-American Program for Sustainable Development, and the Inter-Agency Task Force/Working Group on Mainstreaming Disaster Reduction in Development.

Summary of Activities

1. Hemispheric Actions

The Unit for Sustainable Development and Environment (USDE) promotes initiatives for regional actions related to natural hazard management, disaster reduction, and sustainable development throughout the Western Hemisphere: North, Central and South America. The concrete regional actions currently carried out are: a) the Inter-American Committee on Natural Disaster Reduction (IACNDR), b) the Inter-American Dialogue on Disaster Reduction, c) the Hemispheric Action Plan for Vulnerability Reduction in the Education Sector to Socio-Natural Disasters, and d) the Hemispheric Plan for Environmental Management Guidelines for Road Transportation Corridors.

The IACNDR is the principal OAS forum for analysis of policies and strategies related to natural disaster reduction within the context of the development of the member States. It was created by the OAS General Assembly with the purpose of strengthening the role of the OAS in natural disaster reduction and in the preparedness to respond to emergencies. Chaired by the General Secretary of the OAS, the IACRNDR has created three working groups: 1) Vulnerability Assessment and Indexing, led by the OAS, 2) Financing Natural Disaster Reduction, led by the IDB, and 3) Preparedness and Response, led by PAHO.

The Inter-American Dialogue on Disaster Reduction endeavors to facilitate communication, cooperation, and collaboration among individuals and groups committed to ensuring disaster reduction throughout the Americas. The Dialogue will provide a framework for channeling policy initiatives on disaster reduction and sustainable development into national, regional, and hemispheric political forums. In coordination with the World Bank (WB), PAHO, La Red, and the International Decade for Natural Disaster Reduction (IDNDR), the OAS organized and presented the Second Meeting of the Inter-American Dialogue with the theme of Mainstreaming Disaster Reduction in Development, held in Washington DC in December 1998.

The education sector has developed a hemispheric action plan for vulnerability reduction to socio-natural disasters known as EDUPLANhemisférico. EDUPLANhemisférico is being implemented through technical secretariats in various nations and includes support from the academic sector, NGOs, international development assistance agencies, private sector groups like teachers' unions, and for profit corporations. It identifies and promotes national, regional, and hemispheric mechanisms to facilitate the commitment to carry out the agreed upon activities through programs for advisory, training, technological transfer, and investment. At present, five Technical Secretariats have been assigned to assist in the development and implementation of EDUPLANhemisférico. They represent the United States, Trinidad and Tobago, Argentina, Venezuela, and Peru.

The Hemispheric Plan for Environmental Management Guidance of Road Transportation Corridors is being developed by the USDE with support from IDB, WB, CAF, and the

Pan –American Institute of Highways (PIH) in order to disseminate information in the area of environmental management of road corridors. The Plan is a guide to establishing policy, procedures, and standards based on the experiences to date of the member States.

2. Flood Vulnerability Reduction and Local Alert System in Small River Valleys Program in Central America

This program is to assist municipal governments, official agencies, and non-governmental organizations (NGO's), national as well as local, in hydraulic resource management to prepare vulnerability profiles, mitigation programs and the design, installation and operation of local alert systems from the dangers of flooding in small river basins in Central America. The program is conceived since a national perspective and sweeps from alert systems to mitigation methods with trained people.

At present, this program is in Phase V which involves the coordination with FEMICA and the CRRH and is being implemented in Guatemala, Nicaragua, and Honduras. Phase V counts on the assistance of the Government of Ireland for the work in Guatemala, Nicaragua, and Honduras, and on the assistance of the Pan-American Development Foundation (PADF) for the program in the above mentioned countries and in El Salvador.

The objective of the project consists in the development of a community flood vulnerability program and local alert system in small river basins that includes the following three thematic areas: a) vulnerability analysis and identification of mitigation measures, b) design and installation of a flood alert system, and c) community training for flood emergency preparedness.

3. Vulnerability Reduction of Trade Corridors

The Training and Research Program for Trade Corridor Development Project (PROCORREDOR) has two principal components: research on trade corridor development analysis methodologies and techniques and training activities related to reviewing and refining the analysis of methodologies and techniques. The participants in PROCORREDOR are drawn from the public and private sectors at all levels and are organized around five executing institutions: Universidad Nacional de Cuyo in Argentina, Universidad de Chile, Universidad de Costa Rica, Universidad Catolica de Santiago de Guayaquil in Ecuador and the University of Texas at Austin in the United States.

This initiative is part of the promotion for sustainable cities. Its objectives are to analyze the vulnerability of the road system and to propose activities to ensure that it becomes a catalyst for integrated sustainable development. In order to achieve these goals, workshops have been carried out in Central America, the Andean Region and the Southern Cone. Likewise, there are on going projects of vulnerability reduction in Argentina, Brazil, Paraguay, Chile, Ecuador, and Costa Rica. The projects include both

research and training and are drawn from public and private sectors. The USDE is also coordinating the Regional Project for Natural Hazard Vulnerability Reduction in Trade Corridors of the MERCOSUR.

4. Natural Hazard Assessment and Vulnerability Reduction Program Formulation

The Unit for Sustainable Development and Environment assists countries and/or sectors in the analysis of natural hazard information and the preparation of disaster reduction programs for implementation at the national and regional levels. Projects that involve hazards assessment, vulnerability identification, flood alert systems, post disaster reconstruction, vulnerability reduction and natural resources management have been carried out in all Central America, Bolivia, Brazil, Dominica, Dominican Republic, Ecuador, Peru, St. Kitts and Nevis, St. Lucia, and Trinidad and Tobago.

5. Sector Vulnerability Reduction Programs

The USDE, on the basis of individual economic and social sectors of the member States, provides assistance in the preparation of vulnerability reduction programs, including assessments of the impact of natural hazard events on the sectoral infrastructure. Some of the projects have involved the study about vulnerability reduction to natural hazards in the different sectors: energy, agriculture, and education. Projects have been carried out in all Latin America and Central America with special emphasis in Costa Rica, Ecuador, Honduras, St. Lucia, and Venezuela.

6. Natural Hazards Assessments

Natural hazards assessments are used in creating both hazard mitigation strategies, and integrated regional planning and investment project preparation activities. Some of the countries that have performed Natural Hazards Assessments are Brazil, Colombia, Dominican Republic, Haiti, Honduras, Paraguay, St. Lucia, and St. Vincent and The Grenadines.

7. Collaboration with the European Community Humanitarian Office (ECHO)

The Unit for Sustainable Development and Environment cooperates with the European Community Humanitarian Office (ECHO) in the implementation of several vulnerability reduction projects. Activities include vulnerability assessment, workshop seminars and related technical assistance, and preparation of software programs with instructor training. Vulnerability reduction themes are: schools vulnerability reduction, road transportation vulnerability reduction, flood hazard vulnerability reduction, and country vulnerability profiles based on the agriculture, energy, and transportation sectors. The countries that are participating in the program are Argentina, Belize, Chile, Colombia,

Costa Rica, Ecuador, Honduras, Nicaragua, Panama, Peru, Antigua and Barbuda, St. Kitts and Nevis, Dominica, St. Lucia, and El Salvador.

8. Caribbean Disaster Mitigation Project

From 1993 to 1999, the General Secretariat of the OAS and the US Agency for International Development (USAID) collaborated in the implementation of the Caribbean Disaster Mitigation Project (CDMP). The objective of the CDMP was to establish sustainable public/private sector mechanisms for disaster mitigation which measurably lessen the loss of life, reduce physical and economic damage, and shorten the disaster recovery period. The project had activities throughout all the Caribbean region, with specific pilot activities in: Antigua and Barbuda, Belize, Dominican Republic, Dominica, Haiti, Jamaica, St. Lucia, St. Kitts and Nevis, and St. Vincent and the Grenadines, and Grenada. Further information is available on the project's web site at http://www.oas.org/en/cdmp.

9. Collaboration with the United Nations System in the Disaster Management Training Program (DMTP)

Cooperation with the United Nations Development Program and the Department of Humanitarian Affairs as a regional collaborating institution for the implementation of the worldwide Disaster Management Training Program (DMTP) in disaster prevention, mitigation, preparation and response procedures. Training workshops were offered between 1991-1993 in Barbados, Chile, Colombia, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Jamaica, Mexico, Nicaragua, and Peru.

10. Training Courses and Workshops in Collaboration with Other National and Multinational Entities

The Unit of Sustainable Development and Environment works with national or multinational groups to present training courses on the assessment and mitigation of natural disasters. Courses have been held in Chile, Colombia, Grenada, Guatemala, Honduras, Peru, St. Lucia, Thailand, Trinidad and Tobago, the United Kingdom, and regional workshops for the Caribbean and Latin America.

11. Training and Technology Transfer for Information Management

The USDE provides assistance in the acquisition and installation of geographic information systems (GIS) as well as other systems to manage emergency information and the training of their users. GIS may be used to evaluate natural hazards and analyze vulnerability to such hazards in the context of regional development planning. Workshops in GIS and computer models have been held in Argentina, Brazil, Costa Rica,

Chile, Peru, Antigua and Barbuda, Colombia, Ecuador, Guatemala, Honduras, Jamaica, Nicaragua, St. Lucia, Trinidad and Tobago, and Uruguay.

UNIT FOR SUSTAINABLE DEVELOPMENT AND ENVIRONMENT
ORGANIZATION OF AMERICAN STATES

SUMMARY OF NATURAL HAZARDS MANAGEMENT ACTIVITIES
1983 to present

1. Hemispheric Actions

The Unit for Sustainable Development and Environment (USDE) promotes initiatives for regional actions related to natural hazard management, disaster reduction, and sustainable development throughout the Western Hemisphere: North, Central and South America.

1.1 Inter-American Committee on Natural Disaster Reduction (IACNDR)

The idea of creating the IACNDR was brought about following the mandates of the Summit of Santa Cruz de la Sierra on Sustainable Development and of the Summit of Heads of States and Government of Santiago, Chile. These mandates state that there is a need for deliberation, dialogue and promotion of policies and strategies to inform and guide the decisions of member states both collectively and individually to reduce their vulnerability to natural hazards. Such proposals should aim to both reduce the vulnerability of countries to natural hazards through the implementation of sustainable and responsible development strategies, as well as concentrate on mechanisms to enable more efficient and effective preparedness and response measures. The IACNDR answers those mandates and inputs directly to the Permanent Council of the OAS.

The first meeting of the IACNDR was held on November 8, 1999, in Washington, D.C., during which Secretary General Cesar Gaviria gave his remarks concerning the installation of the IACNDR. He regarded the IACNDR as, "a work program aimed at designing mechanisms of support and coordination for the Inter-American system and the international community to provide assistance and cooperation to the member states when they confront the challenges and risks that natural phenomena such as hurricanes, earthquakes, floods, or volcanic eruptions present to their development and to the lives of millions of Americans throughout the hemisphere."

Secretary General Cesar Gaviria also proposed the organization of three distinct working groups that are to prepare detailed reports to the Permanent Council. The first working group should prepare a proposal for the creation of a coordination mechanism for emergency relief. He asked the Pan-American Health Organization (PAHO) to chair this first working group due to the prominent role in leadership PAHO has played in their efforts in the areas of health, water and sanitation.

The Secretary General then proposed the Inter-American Development Bank (IDB) to coordinate and guide the discussion regarding the financial mechanisms for development that could be offered to countries in need.

The third working group proposed by the Secretary General is to be lead by the OAS. This group's purpose is to identify and assess the vulnerability of the member state citizens and their economic and social infrastructure.

The second meeting of the IACNDR was held on February 8, 2000 in Washington, D.C. This meeting was chaired by Richard Meganck, Director of the Unit for Sustainable Development and Environment of the OAS. At this meeting a report was given as to the activities carried out thus far by the individual working groups.

The Preparedness and Response Working Group of PAHO reported that they have had two meetings and consultations. One apparent need is for periodic orientation workshops on international disaster assistance for international institution staff members and members of the diplomatic missions. This working group's report will cover participation of both public and private sector participants in humanitarian assistance at the various levels.

The Vulnerability Assessment and Indexing Working Group conducted by the OAS, reported on the first meeting of the working group which was held on January 13, 2000. A workshop sponsored by both NOAA and the OAS was held on March 20-22 that presented and discussed technical aspects of vulnerability assessment and indexing methodologies and their application.

The Financing Disaster Reduction Working Group of the IDB mentioned that the IDB is working on changes in the coordination of financial mechanisms for the flow of resources in a post-disaster lending situation. They may establish a Disaster Reconstruction Facility to complement their existing Emergency Reconstruction Facility.

1.2 Inter-American Dialogue on Disaster Reduction

In October 1996, the Hemispheric Congress for Disaster Reduction and Sustainable Development was held in Miami, Florida, USA. As a result of this Congress, a Strategic Plan of Action was proposed and participants called for the creation of an Inter-American Dialogue for Disaster Reduction, as a permanent mechanism for the formulation and negotiation of policy initiatives. The call for this type of hemispheric dialogue was reiterated in the Plan of Action of the Bolivia Summit of December 1996. The Dialogue's mission is to facilitate communication, cooperation and collaboration among individuals and groups committed to insuring disaster reduction throughout the Americas. The Dialogue will provide a framework for channeling policy initiatives on disaster reduction and sustainable development into national, regional and hemispheric political forums.

The first meeting of the Inter-American Dialogue on Disaster Reduction was held in Panama on December 11 and 12, 1997. This meeting had the following objectives:

1. Discuss and define mechanisms to implement the Strategic Plan of Action developed in the Hemispheric Congress for Disaster Reduction and Sustainable Development.
2. Design and propose a viable framework for the establishment and continuation of the Dialogue itself, as an avenue for the discussion and negotiation of initiatives in the hemisphere.
3. Establish a permanent framework for dialogue and negotiation on disaster reduction and sustainable development in the Americas.
4. Facilitate the implementation of the Strategic Plan of Action, formulated at the Hemispheric Congress on Disaster Reduction and Sustainable Development held in Miami, Florida, USA, between September 30 and October 2, 1996, and allow for its monitoring and continued development.
5. Create an open forum, in which all organizations, institutions and individuals involved in promoting disaster reduction and sustainable development in the hemisphere may participate.

This first meeting of the Dialogue was hosted by the National System of Civil Protection (SINAPROC) of Panama and was organized by the OAS, the Network for Social Studies on Disaster Prevention in Latin America (LA RED), the International Hurricane Center (IHC), the Centro para la Prevención de Desastres Naturales en Centroamérica (CEPREDENAC) and the Caribbean Disaster Emergency Relief Agency (CDERA).

The first Hemispheric Congress on Disaster Reduction and Sustainable Development was held in Miami, Florida, USA, from September 30 to October 2, 1996. The work of the Congress built upon the Plan of Action adopted by the Summit of the Americas in 1994, the recommendations of the 1994 Cartagena Inter-American Conference on Natural Disaster Reduction and the 1994 IDNDR Yokohama Strategy and Plan of Action for a Safer World.

The Hemispheric Congress focused attention on the relationship between disaster risk and economic development formulating policy recommendations for action that link the mutually supportive goals of disaster reduction and sustainable development. A central tenant of the Congress was that sustainable development is impossible if existing risk levels are not reduced. Planning and policy must seriously take into account changing hazard and vulnerability patterns in the hemisphere if future and worsening social and economic losses are to be avoided. Furthermore, concerted action linking government sectors, non-governmental and other organizations of civil society, universities, international organizations and the private sector across the hemisphere was emphasized as the only way of negotiating successful policy initiatives to reduce risk and promote sustainable development.

Working groups produced detailed recommendations on a wide range of crucial areas such as gender issues, vulnerable populations, disaster inventories, housing and land markets, community and local participation, education and training for disaster reduction, incorporating disaster reduction into development projects, green accounting and development, insurance and capital markets, research and information sharing, organizational and institutional systems, urban environmental management, vulnerability analysis and mapping, and disaster reduction and humanitarian aid. The recommendations developed by these working groups, including specific policy initiatives, were compiled and published as a Strategic Plan of Action entitled Linking Disaster Reduction and Sustainable Development.

In coordination with the International Bank for Reconstruction and Development (IBRD), PAHO, La Red and the International Decade for Natural Disaster Reduction (IDNDR) the OAS organized and presented the Second Meeting of the Inter-American Dialogue for Disaster Reduction with the theme of Mainstreaming Disaster Reduction in Development (Washington, D.C., December, 1998).

1.3 Hemispheric Action Plan for Vulnerability Reduction in the Education Sector to Socio-Natural Disasters

In response to the Plan of Action developed at the Summit Conference for Sustainable Development in Santa Cruz de la Sierra, Bolivia, December 1996, and the Conference for the Mitigation of Risks of Socio-Natural Disasters in the Education Sector in Caracas, Venezuela, September 15-17, 1997, the education sector has developed a hemispheric action plan for vulnerability reduction to socio-natural disasters known as EDUPLANhemisférico.

In October 1998, the OAS in cooperation with IDNDR Secretariat and Partners of the Americas hosted a Virtual Conference on the Hemispheric Action Plan for Vulnerability Reduction in the Education Sector to Socio-Natural Disasters (Washington, October, 1998). More recently, in Janurary, 2000, another workshop was held in Tegucigalpa, Honduras entitled Reconstruction of Schools in Central America. This workshop allowed individuals from the ministries of education representing various Latin American countries, the respective social inversion funds and other entities involved in school reconstruction to meet for the first time and discuss the issue of disaster vulnerability reduction in school reconstruction, particularly in the areas effected by Hurricane Mitch. The workshop concluded that there is a need for educational seminars addressing the following issues:

- including vulnerability reduction to natural hazards
- school relocation

- drafting, approving and implementing components of national school vulnerability reduction plans
- using natural hazards information in the preparation of school construction, reconstruction and retrofitting to reduce vulnerability to natural hazards.

EDUPLANhemisférico is being implemented through technical secretariats in various nations and includes support from the academic sector, NGOs, international development assistance agencies, private sector groups like teachers' unions and for-profit corporations. It identifies and promotes national, regional and hemispheric mechanisms to facilitate the commitment to carry out the agreed upon activities through programs for advisory, training, technological transfer and investment. The Plan is divided into three areas: academic aspects, citizen participation and physical infrastructure. Each area has proposed activities at the international, national and regional levels for implementation.

At present, five Technical Secretariats have been assigned to assist in the development and implementation of EDUPLANhemisfério. They represent the United States, Trinidad and Tobago, Argentina, Venezuela and Peru. Additional Technical Secretariats are continuously being recruited.

1.4 Hemispheric Plan for Environmental Management Guidance of Road Transportation Corridors

The Unit of Sustainable Development and Environment supports the member states of the OAS in promoting trade corridor development by contributing to an understanding of environmental concerns related to road corridor development, by identifying existing knowledge and expertise in the region, and by promoting corridor development which is resilient to natural hazards. Transportation corridors are important in light of the increasing number and complexity of trade agreements being signed in the Americas, and the resulting increase in transported goods.

The Hemispheric Plan for Environmental Management Guidance of Road Transportation Corridors is being developed by the USDE with support from IDB, IBRD, CAF and the Pan-American Institute of Highways (PIH) in order to disseminate information in the area of environmental management of road corridors. The Plan is a guide to establishing policy, procedures and standards based on the experiences to date of the member states. The Plan is divided into four areas: 1) a guide containing policies, planning processes or procedures, projects (case studies), and preparedness for emergencies; 2) an annotated bibliography; 3) a matrix classifying the documents in the bibliography; and 4) section on the implementation and development of the Plan. 1996 to present.

In coordination with the World Bank, IDB, CAF, the U.S. National Highway Institute, and PIF, the OAS prepared and presented a second draft of the Hemispheric Plan for Environmental Management Guidance in the Road Transportation Sector at the Third Meeting of the Latin American Society of Transportation Environmental Units (Brazil, December, 1998).

2. Flood Vulnerability Reduction and Local Alert System in Small River Valleys Program in Central America

This Program is to assist municipal governments, official agencies and NGO's, national as well as local, in hydraulic resource management to prepare vulnerability profiles, mitigation programs and the design, installation and operation of local alert systems from the dangers of flooding in small river basins in Central America. Activities in five phases has been developed, Phases I and II of the Flood Hazard Mapping and Local Alert System Project in Honduras and Phases III, IV and V in all Central America. The Program considers the need to incorporate mitigation measures in reconstruction activities after Hurricane Mitch's and other disaster impact on Central America and is in coordination with the "Federación de Municipalidades del Istmo Centroamericano" (FEMICA), the "Comité Regional de Recursos Hidraúlicos del Istmo Centroamericano" (CRRH), and CEPREDENAC. To perform the activities the Program uses professionals from the Project as instructors and utilizes the technical material developed for the pilot areas during the prior phases of the project.

2.1 Phase I

It was implemented, with the help of ECHO, the pilot phase of the Project in Honduras, in which basic methodology of a simple alert system was studied. Utilizing community participation to confront the dangers of flooding in the small river basins in communities, which were made principally, of small farmers who were in grave danger from flooding in the pilot areas.

2.2 Phase II

Activities were enlarged to develop a national model in Honduras. A professional team was trained to prepare an analysis of vulnerability, mitigation plans, hydraulic analysis, flooding forecasting, flood monitoring and alert during the pilot project, utilizing the methodology and the techniques developed during Phase I of the Project. They also completed community preparedness activities with attention to emergencies. This experience was utilized as a base for the development of the project to "Reinforce Local Structures and Early Alert Systems" (RELSAT) supported by Disaster Projects of the European Community Humanitarian Office (DIPECHO) and executed by the German Technical Corporation (GTZ) and CEPREDENAC.

2.3. Phase III

The professionals who received training in Phase II in Honduras formed a training base group with other specialists to expand the OAS-ECHO Project throughout all of Central America. During this Phase, regional institutions were actively involved with the Regional Plan for Disaster Reduction coordinated by CEPREDENAC and in which CRRH and the FEMICA were identified for their ties to the thematic areas of the Project. CRRH works with national organizations responsible for the monitoring of hydraulic resources and forecasting river and water flow. FEMICA works with national organizations that work with municipalities. In coordination with these three organizations regional training activities were performed to standardize the methodology and the technical training materials produced by the Program. A mentoring program has been established with the Association of State Flood Plain Managers (ASFPM), to provide a way to exchange the experience in the management of flood plains between professionals and organizations in the United States and Central America involved in flood vulnerability reduction.

2.4. Phase IV

In light of the development of the phenomenon of El Niño, national teams met to work on a pilot program of flood vulnerability reduction, developing local alert systems and program preparation of emergency response in small river valleys in each country. Three teams of professionals were organized in each Central American country to produce technical information corresponding to the three modules covering the thematic areas of the program. This information served as training material in the workshops dictated in the communities where the pilot projects were developed in each country. The modules were:

- Module I: Vulnerability Analysis and Identification of Mitigation Measures
- Module II: Hydrological Analysis, Alert System Design and Hydrological Measurements
- Module III: Community Preparedness

2.5. Phase V

Taking into account the devastating effects caused by Hurricane Mitch in a number of Central American countries, and considering the need to incorporate mitigation methods in the reconstruction activities, it has been suggested to coordinate assistance among municipal governments, official organizations and NGOs in natural resources management to prepare profiles of vulnerability, mitigation programs and the design, installation and operation of local alert systems to flood dangers in several small river basins in Central America. With the Government of Ireland's support, assistance is being given to Guatemala, Honduras, and Nicaragua, six small valleys in each country. With Pan-American

Development Foundation (PADF) support, assistance is being given to El Salvador, Guatemala, Honduras, and Nicaragua.

3. Vulnerability Reduction of Trade Corridors

3.1 PROCORREDOR

The Training and Research Project for Trade Corridor Development Project (PROCORREDOR) was approved for funding support by the U.S. –CIDI Specific Fund- in July, 1999. Soon thereafter arrangements were made for the two principal components of PROCORREDOR: research on trade corridor development analysis methodologies and techniques and training activities related to reviewing and refining the analysis of methodologies and techniques. The primary focus of the analytical methodologies and techniques is environmental management of trade corridor development as manifest in economic, social, and technical aspects of development impact on environment and natural phenomena impact on trade corridors.

The participants in PROCORREDOR are drawn from the public and private sectors at all levels and are organized around five executing institutions: Universidad Nacional de Cuyo in Argentina, Universidad de Chile, Universidad de Costa Rica, Universidad Catolica de Santiago de Guayaquil in Ecuador and the University of Texas at Austin in the United States. These five universities form the basis of the consortium, PROCORREDOR, which will use its expertise, knowledge and experience to better advise the public sector, consult with the private sector and prepare the next generation of multi-disciplinary, multi-sectoral specialists in trade corridor development.

- From September 12 to 15, 1999 the First PROCORREDOR Research Workshop was held at UT/LBJSPA. Information on models and analysis of methodologies was exchanged and discussed. Also, information was developed and exchanged regarding the research and training themes, places, and dates.
    - A representative from the USDOT/Maritime Administration participated in the workshop as well as the five institutions.
    - USDE created an e-mail address for the project at PROCORREDOR@oas.org.
- The Executing Institutions of PROCORREDOR continue to implement their programs of training and research activities.

3.2 Sustainable Cities and Trade Corridors

Andean Region
Central America
Southern Cone

As a follow-up to the Summit Conference on Sustainable Development in Santa Cruz de la Sierra, Bolivia, in 1996, OAS member states are implementing initiatives adopted in the Plan of Action for the Sustainable Development of the Americas in the area of sustainable cities and communities. One of the main themes of this area is related to trade corridors and environmental management. Initiatives in this area include actions for the improvement of natural resource management and reduction of damages caused by natural hazards. With the co-sponsorship of PAHO, IDNDR, and the United Nations Center for Regional Development (UNCRD), the OAS organized three regional workshops on Sustainable Cities and Trade Corridors: Vulnerability Reduction to Natural Disasters, Mandates, and Future Actions, which were held in the Southern Cone (Mendoza, Argentina, September 1998), the Andean Region (Santa Fe de Bogota, Colombia, October 1998), and in Central America (San Jose, Costa Rica, October, 1998). The objective of these regional workshops was to prepare an agenda for actions to be undertaken by international and regional organizations to support the implementation of the Summit initiatives. (1997 to present).

3.3 MERCOSUR Trade Corridor Vulnerability Reduction

Argentina
Brazil
Paraguay

Natural hazards affect the transportation infrastructure of the trade corridors in the region of the MERCOSUR. The Unit of Sustainable Development and Environment is coordinating the Regional Project for Natural Hazard Vulnerability Reduction in Trade Corridors of the MERCOSUR. The objective of the project is to analyze the vulnerability of the road system and propose activities to ensure that it becomes a catalyst for integrated sustainable development. Project activities have been started by the governments of Argentina, Brazil and Paraguay to identify vulnerability and prepare investment projects at the prefeasibility level in order to lower transportation costs in the corridors of MERCOSUR. (1997-1998).

4. Natural Hazard Assessment and Vulnerability Reduction

Note: Activities in the Caribbean from 1993 to 1999 are listed in chapter 8: Caribbean Disaster Mitigation Project.

Program Formulation

The Unit for Sustainable Development and Environment assists countries and/or sectors in the analysis of natural hazard information and the preparation of disaster reduction programs for implementation at the national and regional levels.

Central America	Under the OAS-Central American System for Integration (SICA) agreement, the USDE has been providing assistance to CEPREDENAC and collaborating with regional institutions (CAPRE, COCATRAM, CEAC, CECC, COCESNA, COMTELCA, CORECA, OIRSA) in preparation of a regional and sectoral natural disaster reduction plan. (1994 to 1996).
	Trifinio Area (El Salvador, Honduras and Guatemala): General hazards assessment and vulnerability identification for an OAS integrated development planning project. (1987).
Bolivia	Flood hazard assessment and flood alert system definition in the Mamore River Valley as part of the OAS integrated development project "Integrated Development Program for the Bolivian Amazon Region: Regional Macro Diagnosis and Strategy for Development." (1987).
	Flood hazard assessment and erosion control definition in the Parapetí River Valley as part of the OAS integrated development project "Integrated Development Program for the Bolivian Amazon Region: Regional Macro Diagnosis and Strategy for Development." (1987).
Brazil	Post flood disaster multi-sector reconstruction program for Mundau, Paraiba, with financial support from the United Nation Development Programme (UNDP). (1989-1990).
	Flood disaster reconstruction, flood alert, and water resource management for the state of Alagoas, as part of the OAS integrated development project "Plan for the Development of the São Francisco River Valley." (1989-1990).
Costa Rica	Rio Banano settlement vulnerability reduction and natural resource management program with identification of multi-sectorial investment projects. (1989-1990).
Dominica	Continuation of landslide hazard assessment and hazard mitigation planning activities following hurricane Hugo. (1990).
	Landslide hazard assessment and vulnerability reduction priorities for integrated development project. (1987).

Dominican Republic	Establishment of a cooperative mechanism among NGO's and the private sector at the community level for the prevention of disasters. Done through the Caribbean Disaster Mitigation Project (1993 to present).
	Natural hazards assessment and identification of vulnerability.
	For the five frontier provinces, a settlement infrastructure, a lifeline natural hazards vulnerability assessment, mitigation measure identification, assessment manual for local officials, and workshop for vulnerability identification and reduction. (1987-1988).
	Landslide hazard assessment and identification of disaster mitigation measures for selected settlements in the frontier region. (1987).
Ecuador	Vulnerability Reduction Project for the Pacific Coast after the Floods of 1997, including preparation of guides, models and technical terms of reference for the design, construction and maintenance of rural, energy, school and transportation infrastructure, in order to reduce their vulnerability to floods. (1997).
Ecuador Guatemala	Project review for the USAID mission in these two countries to evaluate the contents related to the management of natural hazards. (1991-1992).
Honduras	Planning strategy for urban watershed management to include natural hazard, natural resource, population, and infrastructure information for Tegucigalpa metropolitan zones under low-income settlement development pressure as part of an OAS integrated development project. (1988-1990).
	General assessment of natural hazard information for integrated development planning. (1984).
Nicaragua	Vulnerability analysis for the mitigation of volcanic eruptions damage for the National Institution of Territorial Studies (INETER). (1990-1991).
Peru	Natural Hazard Vulnerability Reduction Program for development

projects of the National Institute for Development (INADE) with financial support from The United Nations Development Programme (UNDP). (1994 to present).

St. Kitts and Nevis — Settlement and lifeline hazard assessment and identification of mitigation measures. (Island of St. Kitts.) (1986).

Saint Lucia — Coastal and lifeline natural hazard vulnerability assessment, identification of mitigation measures, preparation of an assessment manual for local officials, and presentation of a workshop on the identification and reduction of vulnerability. (1985-1987).

Trinidad and Tobago — Natural hazard assessment and vulnerability reduction program for Tobago. (Trinidad and Tobago's pilot program for the IDNDR).

5. Sector Vulnerability Reduction Program

Note: Activities in the Caribbean from 1993 to 1999 are listed in chapter 8: Caribbean Disaster Mitigation Project.

The Unit of Sustainable Development and Environment, on the basis of individual economic and social sectors, assists the member states in the preparation of vulnerability reduction programs, including assessments of the impact of natural hazard events on the sectoral infrastructure.

Central America — Development of specific components for a Central American agreement on a Disaster Response Plan. Study about the vulnerability of the Central American Highway (CAH) to natural hazards, focusing on specific segments of the CAH (pavement, tunnels, bridges) to specific hazards (floods, landslides, earthquakes, volcanic eruptions), with a listing at the profile level of investment projects for vulnerability reduction. Both activities are being carried out collaboratively by the U.S Department of Transportation and the OAS. (1999-2000).

Electrical energy sector vulnerability reduction program with Central American Electrification Commission (CEAC) with support from the U.S. Department of Energy (DOE). (1995 to 1998).

Latin America — OAS initiative for natural hazard vulnerability reduction in the education and the Caribbean sector in observation of the IDNDR "Stop Disasters in Schools and Hospitals" theme for the International Decade for the Reduction of Natural Disasters, in reference to natural hazard vulnerability of the education sector.

(1992 to present).

Costa Rica	National energy sector natural hazard vulnerability reduction study with definition of investment projects for mitigating disaster impact, and implementation of disaster reduction strategy with support from DOE. (1989 to 1998).
Ecuador	National energy sector natural hazards vulnerability reduction program at the profile level. (1991-1992).
	National agricultural sector natural hazard vulnerability reduction program at the profile level. (1990-1991).
Honduras	Integration of fuel-wood plantation activities in flood and landslide hazard zones in the Tegucigalpa metropolitan area as part of an integrated development project. (1988).
	Infrastructure lifeline natural hazards vulnerability assessment in the Atlantida Department as part of an integrated development project. (1985).
Saint Lucia	Identification of risk perception and awareness of natural hazards of small farmers and criteria definition for disaster mitigation programs. (1988).
Venezuela	Seismic vulnerability and retrofitting evaluation for public buildings in Merida. (1987).

6. Natural Hazard Assessment

Note: Activities in the Caribbean from 1993 to 1999 are listed in chapter 8: Caribbean Disaster Mitigation Project.

The Unit of Sustainable Development and Environment works with the OAS member states to conduct natural hazard assessments. These assessments are used both in creating hazard mitigation strategies and in integrated regional planning and investment in project preparation activities.

Brazil	Desertification hazard assessment for the São Francisco River Valley as part of an integrated development planning project. (1987).

Colombia	San Miguel-Putumayo River Valleys. General natural hazards assessment and Ecuador and hazard impact on integrated projects as part of an integrated development study. (1987-1988).
Dominican Republic	Natural hazard assessment overview of the frontier region for an integrated development planning project. (1986).
Haiti	Natural hazard assessment overview of the frontier region for an integrated development planning project. (1986).
Honduras	Landslide hazard assessment for the Tegucigalpa metropolitan area as part of an integrated development project. (1987).
	Flood hazard assessment for the Department of Atlántida as part of an integrated development project. (1985).
	Landslide hazard assessment for the Department of Atlántida and Isla de la Bahía as part of an integrated development project. (1985).
Paraguay	General natural hazards information assessment of the Chaco region for integrated development planning. (1984).
	Flood hazard assessment of the Chaco region, for an integrated development project. (1984).
	Desertification hazard assessment of the Chaco region, for an integrated development project. (1984).
Saint Lucia	Landslide hazard assessment and definition of vulnerability reduction priorities. (1985).
	Coastal zone natural hazards assessment. (1985).
	General natural hazards information assessment for an integrated Development planning project. (1984).
Saint Vincent and the Grenadines	Landslide hazard assessment and definition of vulnerability reduction priorities for an integrated development project. (1987).

7. Collaboration with the European Community Humanitarian Office (ECHO)

The Unit of Sustainable Development and Environment is cooperating with the European Community Humanitarian Office (ECHO) for the implementation of several vulnerability reduction projects. Activities include vulnerability assessment, workshop seminars and related technical assistance, and preparation of software programs with instructor training.
Vulnerability reduction themes are: schools vulnerability reduction, road transportation vulnerability reduction, flood hazard vulnerability reduction, and country vulnerability profiles based on the agriculture, energy, and transportation sectors.

Central America

Building on experiences of the OAS-ECHO Flood Hazard Mapping and Local Alert Systems Project in Honduras. Phase III has been completed and Phase IV of the Project has been initiated to cover Central America and Panama to train groups of professionals to design and implement flood vulnerability reduction projects in small valleys. (1997 to present).

The Natural Hazard Vulnerability Reduction Program for the Education Sector expanded from pilot countries to include all Central American countries, Belize and Panama. (1995 to 1997).

Central America & Andean Countries

In collaboration with the Pan-American Institute of Highways (PIH), the OAS-ECHO-PIH Project for the Reduction of Vulnerability to Natural Hazards of the Road Network in Central America and the Andean Countries focused on the reduction of the vulnerability to natural hazards of the road transportation system by incorporating mitigation techniques into road construction, reconstruction, maintenance and repair programs, through the development and diffusion of *PerfilMap*, a computer system based on a Geographic Information System (GIS), that enables the user to cross data about the road system with information on natural hazards in order to visualize and analyze the impact of hazards on road infrastructure through the generation of vulnerability profiles. (1995 - 1996).

Countries participating in the OAS-ECHO-PIH Project:

*Argentina
*Chile
Colombia
*Costa Rica
Ecuador
Honduras
Nicaragua
Panama
*Peru

*(workshop site)

Antigua & Barbuda, Dominica,	The Caribbean and its infrastructure are particularly vulnerable to natural disasters, especially following Hurricanes Luis and Marilyn in 1995.
St. Kitts and Nevis	This OAS-St. Kitts ECHO project, a continuation of the effort already begun in Central America, focused on creating a process to reduce the vulnerability of school infrastructure to natural hazards by strengthening local institutions and resources. The results of this project include: the creation of school building vulnerability profiles, national plans to reduce the vulnerability of schools buildings to natural disasters, and country specific school building maintenance manuals. (1997 to 1998).
Costa Rica Ecuador St. Lucia	The Project on Pilot Disaster Vulnerability Profiles for Influencing Sector Development developed a computer software- based methodology (AQUILES) for preparing a vulnerability profile related to the impact of possible natural hazards on the agriculture, energy, and transportation sectors and its effects on national development. (1995 to present).
Honduras	The OAS-ECHO Flood Hazard Mapping and Local Alert Systems Project completed its second phase. Phase I of the Project involved developing a simple flood hazard alert system and vulnerability reduction strategy for the León River Valley. Based on these Phase I pilot activities, Phase II of the Project assisted the national Permanent Contingency Committee of Honduras (COPECO), local emergency committees, NGOs, PVOs, and water resource agencies in training a cadre of Honduran specialist to design, install and operate flood hazard alert and mitigation programs in small river valleys throughout Honduras. (1996-1997).
El Salvador Nicaragua	Natural Hazard Vulnerability Reduction Pilot Program for the Education Sector. (1995).

8. Caribbean Disaster Mitigation Project (CDMP)

The General Secretariat of the OAS (GS/OAS) and the US Agency for International Development (USAID) implemented an agreement by which the OAS executed the Caribbean Disaster Mitigation Project (CDMP). The objective of the CDMP was to establish sustainable public/private sector mechanisms for disaster mitigation which measurably lessen the loss of life, reduce physical and economic damage, and shorten the disaster recovery period. The project addressed some of the major issues in the disaster-

development linkage in the Caribbean such as: the need to reduce natural hazard vulnerability in existing and planned development; mapping of hazard-prone and environmentally fragile areas; the use of mapping information in public awareness and development decision-making; and, the capacity of the insurance industry to better manage risk and maintain adequate catastrophe protection for the region. Detailed information on each of the project activities listed below is available on the project web site at http://www.oas.org/en/cdmp.

Caribbean

Workshop on hazard mapping and vulnerability assessment for physical planners and disaster coordinators. (1999).

Three week training course for building inspectors from five countries in the region. Held in Barbados, September-October 1999.

Workshop on Vulnerability Reduction of Schools and Shelters to Natural Hazards, which culminated a school/shelter vulnerability audit conducted in the Eastern Caribbean. Participants included representatives of the education, public works and engineering sectors. (October 1998).

Study of the Probable Maximum Loss for public infrastructure from a hurricane event in the islands of Dominica, St. Kitts and Nevis, Saint Lucia and Saint Vincent and the Grenadines. (1998-1999).

Workshop on hurricane preparedness, tropical storm forecasting and storm modeling at the US National Hurricane Center for national disaster coordinators and national meteorological officials. This workshop was organized in conjunction with NOAA and FEMA. (1997).

Workshop on hazard mitigation planning for national development officials and national disaster coordinators, organized in collaboration with CDERA. (1997).

Workshops on lessons learned from the CDMP Hurricane-Resistant Home Improvement Program. (1996-1999).

CDMP and the Organization of Insurance Companies of Belize (ORINCO) sponsored a workshop on the role of the insurance industry in mitigating storm-surge risk. (1996).

	At the invitation of the CARICOM Working Party in Insurance Reinsurance, CDMP prepared an issue paper on catastrophe protection in the Caribbean, and assisted the Working Party in the preparation of its report to the CARICOM Heads of State.(1995-1996).
	Design and construction standards for the electrical energy sector working with the UN Center for Human Settlements (UNCHS), CDMP is helping Antigua and Barbuda, Dominica, Saint Lucia and Grenada to introduce a building code based on a model code developed by UNCHS for the Eastern Caribbean Countries (OECS). (1994 to present).
	Training workshop for application of TAOS storm hazard assessment model for use by meteorological institutions in collaboration with the Caribbean Meteorological Institute (CMI). (1994, 1997).
	Workshop on increasing the availability of reinsurance to local insurance companies, PML calculations, and database design, in collaboration with the Jamaican Association of Insurance Companies (JAGIC), Insurance Association of the Caribbean (IAC), and Insurance College of Jamaica (ICOJ). (1994).
Antigua & Barbuda	CDMP conducted a national workshop on storm hazard mapping and its applications within emergency management and development planning. CDMP also supported a national dialogue on safer housing, which focused on private sector involvement. (December 1998).
	CDMP conducted 12 workshops on safe construction techniques 1995-1996. Antigua and Barbuda's UNCHS new building code was used to guide reconstruction/rehabilitation activities after hurricanes Luis and Marilyn. (1995).
Belize	Support for development of a national building code. (1999). A coastal flood hazard assessment was completed. Results were presented at a national seminar on insurance issues.
	Carried out a flood hazard study for the upper sections of the Belize River. (1999).
Dominican Republic	Local community initiatives for hazard mitigation. (1998-1999). Workshop on probable maximum loss and reinsurance availability. (1995).

	Creation of a cooperative mechanism between NGOs and the private sector at the community level for disaster prevention. (1994 to present).
Dominica	Assisted with post-disaster mitigation measures for the landslide-dam in Layou River, (1997-1998)**.**
	The Caribbean Development Bank (CDB) invited CDMP to undertake a storm hazard assessment for Dominica as part of a loan for the rehabilitation of the coastal infrastructure damaged by hurricane Luis. (1996).
	In partnership with the UNCHS, assisted with the development of a national building code.
	The National Development Foundation of Dominica (NDFD) trained local builders, in sound building practices who subsequently formed a cooperative to work at the national level. The five houses that had been retrofitted before hurricane Luis were used as shelters during the storm and survived intact, confirming the training results. (1995 to present).
Haiti	Following normalization of the political situation, the Haiti Pilot and Haiti Project was initiated. It will follow the Dominican project as a model by getting NGOs and the private sector deeply involved in disaster management. (1996 to 1999).
	Awareness campaigns and community training to reduce the vulnerability of substandard housing, and establishment of a refinancing mechanism for reconditioning existing structures. (1994 to 1999).
Jamaica	Support for development of a national hazard mitigation plan (1998-1999).
	In coordination with the Earthquake Unit at the University of the West Indies (UWI), Mona campus, produced a seismic hazard assessment for the Kingston Metropolitan Area. This project comprised two phases: the data collection phase was completed in the fall of 1997 and the modeling phase in the fall of 1999.
	In coordination with the Geology Department of UWI-Mona, compiled a map of landslide susceptibility in the Kingston Metropolitan Area. This work was completed in early 1998. The

	landslide susceptibility modeling results were presented at a technical workshop and the Unit for Disaster Studies of UWI-Mona in February 1998 and at a January 1999 workshop focused on integrating the maps into national development and emergency management planning.
	Installed TAOS software at the Jamaica Office of Disaster Preparedness (ODP). (1995).
	Workshop on insurance sector and reinsurance availability. (1994).
	Coastal storm surge and wind hazard assessment and mapping of the Montego Bay. (1994 to 1999).
Saint Lucia	Support for development of a national hazard mitigation plan, including a national consultation to discuss the draft plan. (1998).
	Training of local builders and provision of revolving loan funds to promote retrofitting of hazard-prone low-income housing. Coordinated and administered in St. Lucia by the National Development Foundation and CARITAS. (1996 to 1999).
	Incorporation of mitigation elements into reconstruction following tropical storm Debbie. (1994 to 1997).
	Energy sector vulnerability audit and hazard management recommendations with LUCELEC. (1994).
St. Kitts and Nevis	Local contractors were trained in post-hurricane reconstruction and repair, and a retrofit program was initiated. (1996 to 1998).
St. Vincent & the Grenadines	A risk analysis of the St. Vincent and the Grenadines electric utility used techniques documented in the Saint Lucia and Dominica pilot audits to produce specifications for optimal design and mitigation standards for the utility's transmission/distribution system that would result in minimum operating costs over its lifetime. (1996).

9. Collaboration with the United Nations System in the Disaster Management Training Programme (DMTP)

The Unit of Sustainable Development and Environment is cooperating with the United Nations Development Programme and the Department of Humanitarian Affairs as a regional collaborating institution for the implementation of the worldwide Disaster Management Training Programme (DMTP). Regional and national workshops prepare

UN agency field personnel and their national counterparts in disaster prevention, mitigation, preparation and response procedures as part of a worldwide program.

Country training workshops were offered for the United Nations field agencies and their national counterparts.

Barbados (1992)	Honduras (1992)
Chile (1991)	Jamaica (1992)
Dominican Republic (1992)	Mexico (1992)
Ecuador (1993)	Nicaragua (1992)
El Salvador (1992)	Peru (1992)
Guatemala (1991)	

Regional training workshops for deputy resident representatives and disaster focal points for the UNDP in Latin America and the Caribbean.

Barbados (1991)	Colombia (1991)

10. Training Courses and Workshops in Collaboration with Other National and Multinational Entities

In addition to collaborating with the United Nations Development Programme to present Disaster Management Training Workshops, the Unit for Sustainable Development and Environment also works with other national or multinational groups to present training courses on the assessment and mitigation of natural disasters.

Central America	Regional training course on integration of natural hazard information in the preparation of road investment projects, and on the use of GIS as a tool for information preparation for road investment projects, for 20 participants associated with the CAH Vulnerability Study to Natural Hazards. This project was a US Department of Transportation-OAS collaborative activity. (November 1999- March 2000).
Caribbean	First Caribbean workshop on Natural Hazard Vulnerability Reduction Programs for School Buildings in Trinidad. (1993).
	Landslide hazard assessment and landslide susceptibility mapping workshop. Twenty-three local participants and seven international participants in collaboration with the Office of Disaster Preparation (ODP), University of the West Indies (UWI), and Pan Caribbean Disaster Prevention and Planning Program (PCDPPP) in Jamaica. (1989).

Workshop on settlement infrastructure vulnerability to natural hazards, with 24 participants from 5 countries, in collaboration with PCDPPP, in Saint Lucia. (1988).

Caribbean
Latin America

Central America Regional Workshops by the OAS-ECHO School Vulnerability Reduction Program on project initiation and development, in Venezuela, 1997, in Honduras, 1996, and in Nicaragua, 1995.

Workshop on Profiling National Highway System Vulnerability to Natural Hazards in Argentina. (1995).

First Latin American Workshop on Natural Hazard Effects Reduction in Energy Infrastructure in Costa Rica. (1995).

Two workshops on electrical utility company vulnerability reduction to earthquakes and preparation of training materials in Spanish with the Central United States Earthquake Consortium (CUSEC) in the United States of America. (1994).

Co-sponsorship of IDNDR meetings with the Pan-American Health Organization (PAHO), including members of the Inter-American system. Jamaica, 1992, and Guatemala, 1991.

Reduction Programs for the Education Sector at CINTERPLAN Natural Disaster Vulnerability in Caracas, Venezuela. (1992).

In collaboration with the Ministry of Agriculture, a natural hazard vulnerability reduction training course for the agricultural sector in Ecuador. (1992).

Course on the use of natural hazard information in investment project formulation. In collaboration with the Peruvian-Japanese Center for Seismic Investigation and Disaster Mitigation (CISMID) in Peru. (1992).

Course on the use of natural hazard information in investment project formulation in collaboration with The Central American Institute of Public Administration (ICAP) in Costa Rica. (1988).

Design and execution of two pilot courses on the use of natural hazard information in investment project formulation, with 42 participants from 18 countries in collaboration with the Inter-American Center for Integrated Development of Land and Water (CIDIAT), in Venezuela. (1986).

Chile	Workshop on natural hazard assessment and integrated development planning in collaboration with the National Forestry Corporation (CONAF). (1987).
Colombia	Energy sector natural hazard vulnerability reduction workshop with the Ministry of Energy and Mines. (1991 and 1992).
	Course on the use of natural hazard information in investment project formulation, in collaboration with the "Agustín Codazzi" Geographic Institute (IGAC). (1989).
Grenada	Workshop on hazard risk assessment and energy planning with parish representatives in collaboration with the Government of Grenada. (1987).
Guatemala	Training course for landslide hazard evaluation in collaboration with the U.S. Agency for International Development's Office of Foreign Disaster Assistance (USAID/OFDA) and the U.S. Forest Service. (1992).
	Natural hazards management workshop for the public sector and private agencies in collaboration with USAID/OFDA. (1992).
Honduras	Workshop on school and library natural hazard vulnerability reduction in collaboration with Partners of the Americas. (1992).
Peru	Workshops on the vulnerability reduction of productive and social infrastructure projects to natural hazards in collaboration with INADE and with support from UNDP. (1993, 1994, and 1995).
Saint Lucia	Two workshop sessions completed to improve natural hazard awareness and disseminate mitigation practices among banana growers. 80 farmers and 30 extension officers participated in collaboration with UWI and PCDPPP. (1989).
	Workshop on natural hazard risk assessment, lifeline infrastructure vulnerability analysis, and emergency planning information for town and village clerks. (1987).
Thailand	Presentations on natural hazards and development planning at the 5th Disaster Management Course, in collaboration with the Asian Institute of Technology (AIT) in Bangkok. (1988).

Trinidad and Tobago — Two week training workshop in landslide hazard assessment and preparation of landslide susceptibility maps, in collaboration with the University of the West Indies and PCDPPP. (1989).

United Kingdom — Co-direction of a workshop on housing planning and reconstruction, in collaboration with Oxford Polytechnic University. (1986).

11. Training and Technology Transfer for Information Management

The Unit for Sustainable Development and Environment assists OAS member states in the acquisition and installation of a GIS and systems to manage emergency information and the training of their users. In addition, the technical staff assists member states to install a GIS for use in integrated development planning. GIS may be used to evaluate natural hazards and analyze vulnerability to such hazards in the context of regional development planning. Other applications for GIS technology include: evaluation of the risk of natural hazards; determination of hazard-free zones for urban development; determination of soil type and actual soil use; identification of critical elements in population centers in areas at high risk to natural hazards; and determination of priority zones for the execution of hazard mitigation and vulnerability reduction.

Latin America — Workshops on the use of computer models for analysis of the vulnerability of road systems to natural hazards in collaboration with PIH and support from ECHO.

Argentina (1995, 1996)
Brazil (1997)
Costa Rica (1996)
Chile (1996)
Peru (1996)

Antigua & Barbuda — Assistance in the installation of an EIS in collaboration with PCDPPP. (1990).

Colombia — Installation of a GIS and user training for the Regional Autonomous Corporation (CAR). (1989).

Costa Rica — SMEI Installation and user training for the National Emergency Committee Ministry of Natural Resources, Energy and Mines (MIRENEM) and the National Energy Commission (CNE). (1988 and 1989).

Ecuador — Installation of a GIS and user training for the Ministry of Agriculture. 1990-1991, Secretariat for Planning, (1996).

Guatemala	GIS installation and user training for INSIVUMEH and the Dirección General de Caminos.(1992).
Honduras	Installation of a GIS and user training for the National Institute for Territorial Studies (INETER.) Participants also included the National Energy Commission (COPEN) and the National Planning Secretariat (SECPLAN). (1990-1991).
	Installation of an EIS and user training for the National Planning Secretariat (SECPLAN), the National Emergency Council (COPEN), and the Metropolitan Planning Agency (METROPLAN). (1989).
	GIS user training for the Tegucigalpa metropolitan area, with participants from the Municipality of Tegucigalpa and the National Planning Secretariat (SECPLAN). (1987).
Jamaica	Installation and use of EIS for post-disaster rehabilitation after Hurricane Gilbert in collaboration with the Office of Disaster Preparedness (ODP). (1988).
Nicaragua	Installation of GIS and user training for the evaluation and management of natural hazards and development planning for INETER. (1990-1991).
	Course on information management and meteorological and seismic hazard analysis for INETER. (1990-1991).
	Training course on landslide hazard mapping for INETER. (1990-1991).
Saint Lucia	Installation of a SMEI in collaboration with PCDPPP. (1990).
	Installation of a GIS for the Government of Saint Lucia. (1989).
Trinidad and Tobago	Assistance in the installation of a SMEI. (1990).
Uruguay	Installation of a GIS and user training for the National Budget and Planning Office. (1990).