ACTIVITY COMPLETION REPORT

Guatemala-Central America Programs: Mitch Special Objective: Improved Regional Capacity to Mitigate Transnational Effects of Disasters (596-004)

USAID Project Nos. 596-0181.10, 0181.2, 0182.0, 0183.00
Approved: September 30, 1999
Activity Completion Date: December 31, 2001.
Total Cost: $13,500,000
Funding Sources: $13,500,000 Central America and Caribbean Emergency Relief Fund (CACEDRF).

Intermediate Results (IR) Characteristics:
IR1, Framework Established for Sound Transnational Watershed Management. $4,000,000. Funding source: CACEDRF
Principal Partners: The Central American Integration System (SICA), and three of its entities - the Regional Commission for Hydrologic Resources (CRRH), the Center for Natural Disaster Prevention in Central America (CEPREDENAC), and the Central American Commission for Environment and Development (CCAD), the National Oceanic and Atmospheric Administration (NOAA) and the United States Geological Survey (USGS).
Key IRs: (1) Effective institutional arrangements for watershed management; (2) Joint watershed management and disaster mitigation plan developed; and (3) Information base and tools for decision making in place.
Results summary: **(1)** A state-of-the-art forecast system for the transnational Río Lempa watershed was designed, installed and is fully functional. **(2)** A joint management plan which identifies geographic and thematic priorities among a broad spectrum of stakeholders and that lays out a tri-national program that includes institutional arrangements for disaster mitigation, natural resources management and improved livelihoods along the watershed was developed and implemented. **(3)** To make the Rio Lempa forecast system work, sub-systems including meteorological data rescue, coordination of meteorological institutions, development of a geographic information system, and an accumulated rainfall model all have been put in place and are functioning.

IR 2: Regional Guidelines and Standards Developed to Reduce Road Network Vulnerability to Natural Disasters, $500,000 **Funding Source:** CACEDRF. **Principal Partners:** The Central American Economic Integration Secretariat (SIECA), which is the Technical Secretariat of the Regional Council of Transportation Ministers (COMITRAN).
Key IRs: (1) Strengthening of regional coordination mechanism focused on roadway network vulnerability, and (2) Action plan to upgrade the road network defined and initiated.
Results summary: (1) Five manuals, (a) Road construction manual, (b) Road maintenance manual, (c) Standards for road signs, (d) Standards for geometric design of roads, (e) Limits to weights and dimensions of vehicles, were researched and produced. **(2)** The manuals have been distributed to each Ministry of Transport in each of the five Mitch-affected countries (Guatemala, El Salvador, Honduras, Nicaragua and Costa Rica), and to national and international institutions.

IR 3: Costa Rican Education System Capacity Upgraded in Selected Communities Affected by Mitch Related Nicaraguan Migration. $4,983,000 **Funding Source:** CACEDRF. **Principal Partners:** The International Organization for Migration (IOM), the Costa Rican Ministry of Education (MEP).

Key IRs: (1) Expanding education infrastructure, (2) Improving access to educational materials, (3) In-service teacher and school administrator training, and (4) Strengthened adult education.

Results summary: (1) 260 new classrooms built, 120 classrooms repaired with two converted into computer laboratories, and 55 sanitary units built and two repaired. **(2)** Purchased 56,000 sets of teaching materials and distributed them to 310 schools for use by 36,000 students; 15 TVs, 15 VCRs, and 15 overhead projectors distributed. **(3)** In-service training provided to 1,665 teachers from 326 schools; 207 schools participated in remedial education activities for 7,110 students of which 30% were Nicaraguan immigrants. **(4)** Adult literacy programs established in 200 schools, enrolling 4,200 adults.

IR4: Strengthening regional policies that reduce energy system vulnerabilities to disasters. $4,200,000 **Funding Source:** CACEDRF. **Principal Partners:** Department of Energy, $200,000 direct transfer; NRECA 1,605,000 Cooperative Agreement; PA Consulting $2,200,000 IQC Task Order; USAID management $195,000.

Key IRs: (1) Regional energy sharing advanced; (2) Improved efficiency of the energy sector through restructuring; and (3) Promote renewable energy and equity (especially for economic reactivation).

Results summary: (1) Emergency energy plans drafted for El Salvador, Guatemala, Honduras and Nicaragua. **(2)** Helped create Regional Power Operator to facilitate regional interconnection issues; developed transitional regulations and procedures for regional energy interconnection.**(3)** Benefited 2,045 families with new service either to the grid or renewable energy; installed 97 photovoltaic systems (81 in Nicaragua and 16 in Guatemala).

Lessons Learned: At the SpO Level

1. Institutions within the System for Central America Integration (SICA) proved to be effective partners. Partnerships with institutions such as the Central American Commission on Environment and Development (CCAD) and the Regional Committee on Hydrologic Resources can greatly facilitate the implementation of disaster mitigation actions by: a) undertaking regional tasks; b) serving as a liaison between USAID and national level institutions.
2. The benefits of a regional action to reduce the impact of disasters are not equally divided among countries. For example, a flood forecast system benefits downstream countries more than those upstream. Accordingly, when only national interests are considered, upstream countries tend to demonstrate only limited interest in this category of activity. By working with regional organizations, such as CCAD and CRRH, the regional integration and collaboration flag can be raised to foster active participation by all countries involved. The activities also should include some elements that benefit the upstream country institutions such as capacity building.

3. The short execution period (two years) was originally a drawback as it imposed a pace that was at first perceived to be too hasty by the host government counterparts. However, the quick pace turned into an asset later on, because it facilitated a rapid learning curve and quicker understanding of the project, its objectives, strategies and methods by the participants, and contributed to creating a climate of coherence and confidence.

Lessons Learned IR1: Framework Established for Sound Transnational Watershed Management.

1. National institutions responsible for recording, interpreting and disseminating climate related information such as the meteorological services are weak. Their effectiveness as a partner may be compromised unless an institutional capacity building element is part of the activity.

Lessons Learned: IR2 Regional Guidelines and Standards Developed to Reduce Road Network Vulnerability to Natural Disaster

1. It was necessary to develop a mechanism to systematize the studies and manual preparation directed at strengthening the road system in Central America in order to avoid "reinventing the wheel" for each manual.
2. The ministries dealing with roads infrastructure in each country were involved in the development of regulations for the regional roads. This proved to be very important and allowed that all views were taken into account from the beginning and the results were accepted more readily. This IR accomplished this by including representatives from each ministry in the technical groups formed to develop the manuals, and by having these representatives present the manuals at the country presentations.
3. Good dissemination of the manuals was felt to be a must in order to avoid having "shelved" manuals at the end of a project. This was accomplish by having one presentation of the manuals in each of the CA countries to a wide audience that included representatives from international donor community, other ministry employees, other government entities, construction chambers, the private sector, and universities. Host-country ministerial representatives involved in developing the manuals gave the presentations

Lessons Learned: IR3 : Costa Rican Education System Capacity Upgraded in Selected Communities Affected by Mitch Related Nicaraguan Migration

1. **Identification of needs:** That the Project responded to difficulties teachers had consciously identified in their daily work was key to their interest in applying the proposed tools (training and materials).
2. **School selection:** Schools were chosen on a strictly technical basis, which allowed the project to work with a very consistent population profile. The basis was the percentage of immigrant students in the school.
3. **Strategic approach:** A well thought-out strategy for project implementation permitted constant feedback and adjustment to the project. During the first year, resources to improve school performance were put in place that included new and repaired

classrooms, sanitary units, and training and materials. During the second year, the project concentrated on technical assistance to these schools to optimize application of resources.

4. **Timing is everything:** Implementation of this kind of project requires adequate synchronization and timing in the execution of the various components and subcomponents in order to produce the desired effects. For example, coordination of a large number of institutions, such as government entities, NGOs, universities, local communities and private enterprise, with different response times, was necessary to achieve the expected effects in the field.
5. **Teamwork:** The deliberate effort to build teamwork enhanced creativity and communication, which in turn improved feedback and project adjustment, when needed.
6. **Two years is not enough to guarantee sustainability of the Project:** Although every care was taken to ensure sustainability and the project has been able to build a satisfactory number of sustainable elements, the 2-year period was insufficient time to consolidate the project as a whole and assist the Ministry and school in this task, leaving the investment at risk. A three-year period would have been better to help consolidate the efforts.

Lessons Learned: IR4: Strengthening regional policies that reduce energy system vulnerabilities to disasters.

1. **Consulting team with previous experience:** The key to success for PA Consulting, was the use of a technical team that was already working on the subject, was already doing a good job, knew the situation in each country and had close relationships with the Central American governments and counterparts.
2. **Divide and Conquer:** With six countries in Central America involved (Costa Rica, Panama, Nicaragua, Guatemala, El Salvador, Honduras) in the regional power sharing efforts, with private and public sector representatives competing with each other, and with very different energy sector models in each country and at different stages of restructuring, the only way to have some consensus was to work out issues between two neighboring countries at a time and develop "transitory" rules for the Regional Energy Market Operator (EOR), so that the regional electricity transactions could start. A global solution to all issues by all countries and all interested players was impossible at this point and would have paralyzed the regional market sharing effort.
3. **Energy disaster preparedness in Central America is unfinished:** The emergency plans developed showed that there are about four to six institutions in each country vulnerable to emergency situations, each with unclear areas of responsibility and commitment. Although each country has different levels of sophistication in dealing with emergencies, none has a systematic approach to the problem. The plans identify areas of weakness in the system in each country, and identify specific areas that lack approaches for dealing with natural disasters such as floods. The plans focus on the operation of only one hydroelectric power plant and transmission lines for each country because of the enormity of the problem. Some electric utilities in the region have expressed interest in applying the same methodology in other hydropower plants. The plans are only a first step to reduce power sector vulnerability to natural disasters.
4. **NRECA success:** Fourteen year's experience with rural electrification in Guatemala, its excellent relationships with municipalities and communities, its willingness to collaborate closely with other NGOs, and the application of creative and effective

time-saving procurement and management procedures made it possible for NRECA to complete grid extension projects in 18 months and community PV projects in six months. However, because its project preparation work was funded by NRECA itself outside the RREICA Program budget – a cost that was critical to rapid project execution - the Mitch budget under-represents the true financial cost of carrying out the program. Also, it is likely that costs per connection ratio could have been lower with a longer project time frame in which more households could have afforded house wiring costs.

5. **Community involvement** at the site-selection phase and in co-financing electrification costs can expedite a program and help in its long-term sustainability. However, this requires considerable coordination effort and can work smoothly only when the implementing organization is considered trustworthy and has established a long-term relationship with municipalities and local organizations.
6. **Written agreements:** Unión Fenosa and other power suppliers can be expected to change the standards, requiring expensive changes during program implementation, when written agreements fixing standards for the duration of the program are missing.

Indicator Assessment: The SpO tracked only output indicators (see Results Summary above). For example, physical targets for the number of classrooms built, studies completed, renewable energy systems installed, also served as indicators of progress.

Close Out Reports: The Mission has received and cleared final reports for the strategic objective agreements (SOAG) relative to IR1 and IR2, as well as the final report and inventory for the PIO grant to IOM in IR3, and the final reports from NRECA for its Cooperative Agreement, and PA Consulting for its Task Order. Final audit reports will be submitted on or before March 31, 2002.

Results Framework Issues During Implementation: The SpO framework underwent one change during its two-year implementation. IR4, strengthening regional policies that reduce energy system vulnerabilities to disasters, was added in mid-CY 2000.

Sustainability of Impact: The foundation for the Río Lempa Forecast Center's sustainability under IR1, lies in the tri-national agreement signed in January 2002. That agreement is a basin-wide strategic plan for tri-national collaboration in watershed management and disaster mitigation. However, the true test will come when a weather event can actually put the system to use and the benefits of the system can be experienced first hand. The sustainability of IR2, road vulnerability investments, is assured by the success of the original five studies and manuals produced under the IR, as well as the fact that follow on work is underway on three additional manuals. The ministries of transport and communications in the region consider this area a high priority and are treating it as such. The Costa Rican Ministry of Education authorities have considered the investments in education under IR3, to be very successful, much needed, and have been put to immediate use. Their maintenance and care is assured given the high level of importance vested in both the infrastructure and the supporting training and educational materials made available for the purpose of assisting migrant assimilation. Finally, with respect to the IR4 energy investments, work under all three areas was sufficiently advanced under the SpO that sustaining the efforts is considered very likely. Energy sharing and energy sector restructuring, including emergency planning to reduce

vulnerability, made great strides such that regional countries will continue the efforts. Also, similar interventions will take place in the region following Mitch reconstruction, under USAID/G-CAP, that will encourage continued efforts in this sector. The benefit of policy reform to promote energy sharing was experienced first hand in El Salvador following that country's twin earthquakes in early 2001. Stepping back from that progress at this time is unlikely. Similarly, renewable energy sources put in place are viewed as a model for continued advancement in this area.

Contact Persons:

George Carner, Mission Director

Richard Whelden, Regional Deputy Director

Joao de Queiroz, USAID/G-CAP Regional Climate Change Advisor, responsible for all IR1 agreements and issues.

Marta Velazquez, USAID/G-CAP, Chief, Trade and Economic Analysis, responsible for all issues related to IR2, IR3 and IR4.

John Chudy, Mitch Coordinator, responsible for maintaining all reports and files on the implementation of the SpO.

Liliana Gil, Program Development and Management, for all issues pertaining to the Special Objective Agreement with SICA.

Annex 1: FINAL REPORT

March 2002 (No. 10)

Improved Regional Capacity to Mitigate Transnational Effects of Disasters

Summary: This tenth volume is the final report on the USAID/Guatemala-Central America Program's use of grant assistance under the Hurricane Mitch Regional Special Objective (SpO). Last quarter (No. 9), we reported that the program was nearing completion of activities and the achievement of targets. This volume presents the final liquidation of expenditure accounts, a summary of the results achieved, and a review of lessons learned.

The regional Mitch Reconstruction Special Objective (SPO) has pursued four intermediate results. These include: (1) framework established for sound transnational watershed management, (2) regional guidelines and standards developed to reduce road network vulnerability to natural disasters, (3) Costa Rican education system capacity upgraded in selected communities affected by Mitch-related Nicaraguan migration, and (4) strengthening regional policies that reduce energy system vulnerabilities to disasters.

USAID/G-CAP is working with the Nicaragua, El Salvador, Guatemala and Honduras missions, the U.S. Embassy Costa Rica, USAID/Washington, and USG agencies on these regional Mitch reconstruction efforts.

IR 1: Framework Established for sound Transnational Watershed Management

Key Intermediate Results: : (1) Effective institutional arrangements for watershed management; (2) Joint watershed management and disaster mitigation plan developed; and (3) Information base and tools for decision making in place.

Highlights:

- A state-of-the-art forecast system for the Río Lempa watershed is fully functional. This system, which entails the installation of a network of automated meteorological stations, river gauges, sophisticated hydrologic model, computer hardware, capable personnel, and appropriate institutional arrangements is used to help the watershed countries of El Salvador, Honduras and Guatemala mitigate the impact of extreme climatic events such as droughts and floods, and manage reservoirs for optimum electricity generation.

Overall Impact: The accomplishments of USAID and its principal partners; the Central American Integration System (SICA), the National Oceanic and Atmospheric Administration (NOAA) and the United States Geological Survey (USGS) in the Río

Lempa watershed are unprecedented. To the best of our knowledge this is the first time a state-of-the-art river forecast system such as NOAA's National Weather Service River Forecast System (NWSRFS) has been installed in a transnational watershed with full participation of all watershed countries. It is also the first time that three entities of SICA –the Regional Commission for Hydrologic Resources (CRRH), the Center for Natural Disaster Prevention in Central America (CEPREDENAC), and the Central American Commission for Environment and Development (CCAD), worked side-by-side in the implementation of concrete field-level activities.

This is also the first time that a comprehensive Geographic Information System (GIS) was developed for a transnational watershed in Central America with disaster mitigation as one of its principal objectives. The development of the GIS entailed the reconciliation of conflicting map projections and compilation of information dispersed across a myriad of institutions across three countries. Finally, USAID and its partners used state-of-the-art software to digitize historical meteorological and hydrological data that were stored in deteriorating paper files in Honduras, El Salvador and Guatemala. All this took a degree of coordination across institutions and countries that set the standards for regional programs.

When USAID initiated the Río Lempa activity, the national meteorological and hydrological agencies that were key counterparts had no reliable E-mail connection, were given low priority by national governments, and were losing valuable meteorological and hydrological information through deterioration of paper files. Today, meteorological and hydrological information processing and interpretation is viewed as a key element in El Salvador's disaster mitigation strategy, all institutions have capable personnel and equipment to digitize, store and manage invaluable data, and have improved their telecommunications capacity tremendously.

IR1.1 Effective institutional arrangements for watershed management

The activities in the Río Lempa watershed were launched with a meeting of principal institutions that had or were planning programs in the basin. As an outcome of this meeting and subsequent continuous coordination and communications, USAID and its partners succeeding in standardizing the types of equipment used for hydrologic and meteorological monitoring in the watershed. The ensuing technological compatibility enabled the river forecast system to encompass not only stations established with USAID assistance, but also those put in place by other programs. Furthermore, this institutional coordination ensures that replacement parts purchased by any program can be used in any meteorological or hydrological monitoring station irrespective of the funding source.

During the implementation of the program, El Salvador decided to amalgamate the functions of all agencies dealing with disaster monitoring and forecasting into one institution: the National Service for Territorial Studies (SNET). USAID's assistance provided through NOAA had a significant bearing in helping the Salvadorans think through the structure and function of this new institution. Furthermore, the forecast system for the Río Lempa has become a key element of SNET's disaster forecast and mitigation arsenal.

At the December 2001 inauguration of the Río Lempa Forecast Center in San Salvador, the Vice-President of El Salvador announced his government's intention to sign an agreement with Honduras and Guatemala for the collaboration in the management of the Río Lempa watershed. That agreement, which was reviewed by the Ministries of Foreign Affairs of the respective countries prior to being signed by the Ministers of Environment from the three watershed-countries, is rooted on a basin-wide strategic plan for tri-national collaboration in watershed management and disaster mitigation developed under this Intermediate Results. Signing of the agreement took place January 17, 2002.

Finally, SICA's project administration unit administered with technical assistance from NOAA, certain technical activities carried out under the Mitch program. To do this SICA had to sub-contract US-based high-tech companies (e.g. Riverside Technologies Inc.) and US Universities (Colorado State University's Cooperative Institute for Research in the Atmosphere). This type of contractual relationship between an intergovernmental Central American Organization and US firms and universities is also a first, and attests to the capacity for program implementation that USAID's regional program has helped establish in Central America.

IR1.2 Joint watershed management and disaster mitigation plan developed

A strategic plan for the joint management of the watershed was developed in a fully participatory manner. The plan, which identifies geographic and thematic priorities, was vetted with a broad spectrum of stakeholders and lays out a tri-national watershed-level program that includes institutional arrangements for disaster mitigation, natural resources management and improved livelihoods. Its strength lies in a thorough diagnosis of the problems affecting the Río Lempa watershed made possible by the GIS developed under IR1.3 described below. The plan includes an annex with a carefully selected number of proposals for priority actions in the short and medium terms that should help the Plan Trifinio Secretariat set its agenda for the next five years. The watershed management plan was developed by CATIE, a regional Central American organization under a sub-contract with SICA. Hence this process was led and implemented by Central American institutions.

IR1.3 Information base and tools for decision making in place

USAID and its partners put in place a state-of-the-art river forecast system for the Río Lempa watershed. Given the initial conditions (e.g. poorly organized data, weak organization, skeptical stakeholders) unforeseen events (e.g. earthquake) and time frame for the installation of this system this was a heroic accomplishment.

The forecast system entailed the installation and/or development of a number of sub-systems such as a network of automatic river gauges and meteorological stations in three countries, a hydrological model and data transmission hardware and protocols. But before any of this could be done, historical meteorological and hydrological data had to be "rescued. This entailed a coordinated effort by the CRRH and each of the national meteorological and hydrological organizations in Honduras, Guatemala and El Salvador.

The three countries now also have a state-of-the-art GIS for the watershed. This effort required the compilation of data from a myriad of organizations, standardizing a number of different map projection standards, and developing a digital elevation model and all other tasks generally associated with a GIS. Also, high resolution GISs were developed and training was provided for eight critically vulnerable municipalities in the Lempa Watershed. Finally, USAID and its partners installed in Costa Rica the capacity for ingestion, processing and display of real time satellite data of cloud conditions. A model linked to the satellite data receiving and processing system processes the data and displays total accumulated rainfall for the previous 1 hour, 6 hours, and 24 hour periods. This information may be viewed at http://www.cira.colostate.edu/ramm/sica/main.html.

IR 2: Regional Guidelines and Standards Developed to Reduce Road Network Vulnerability to Natural Disasters

This intermediate result supported the Central American Economic Integration Secretariat (SIECA), which is the Technical Secretariat of the Regional Council of Transportation Ministers (COMITRAN), in developing harmonized roads standards for the region to mitigate future effects of natural disasters on the transportation infrastructure.

Key Intermediate Results: (1) Strengthening of regional coordination mechanism focused on roadway network vulnerability, and (2) Action plan to upgrade the road network defined and initiated.

Performance: Results under this IR exceeded the original goal of developing five road and transportation manuals and an action plan to implement them. The manuals and the action plan were completed ahead of time and some funds were left over. A new work plan was submitted and approved to develop scopes of work for three additional manuals that will be completed with funding from the USAID/G-CAP PROALCA II program. The additional manuals to be completed with PROALCA II funds will be: (a) Strengthening of CA Institutional and Legal Framework on Concessions; (b) Environmental Standards for Road Construction, Maintenance, and Design; (c) Study and Evaluation of Pavements Bearing Capacity.

Highlight: The five manuals produced in this activity are the first of their kind in the region, and are already being included in new infrastructure projects. The manuals have raised the interest of other donors to finance complementary manuals. For example, the Inter-American Development Bank credits the activity as a starting point for road interconnection for the Puebla to Panama Plan. The application of these manuals will not only reduce vulnerability of the road network to future natural disasters, but will also result in better interregional trade resulting in economic growth for the region.

IR 2.1 Strengthening of regional coordination mechanism focused on roadway network vulnerability: Five manuals were produced: (a) Road construction manual, (b) Road maintenance manual, (c) Standards for road signs, (d) Standards for geometric design of roads, (e) Limits to weights and dimensions of vehicles. SIECA coordinated the work of several consultants who conducted these studies with a technical group from each of the Ministries of Transport in a series of 13 workshops, and COMITRAN approved the manuals.

A mechanism to coordinate efforts regionally to strengthen the road system in Central America (CA) has been established. The system involves SIECA contracting consultants to carry out studies and prepare draft manuals. The contractor and SIECA form a technical group with representatives from the Ministries of Transport in the CA countries to develop the manuals. The final version is ratified by COMITRAN and then reproduced, and dissemination seminars are carried out in each country.

IR 2.2 Action plan to upgrade the road network defined and initiated: Widespread distribution was given to the manuals by conducting one seminar in each of the five Central American countries. Manuals have been distributed to each Ministry of Transport, national and international institutions such as universities, professional organizations, USAID missions, the IDB, the WB, CABEI, and others. Four hundred CDs and 200 hard copies were reproduced and disseminated as part of this effort too**.** There was active participation of appropriate stakeholders in each of the five Mitch-affected countries (Guatemala, El Salvador, Honduras, Nicaragua and Costa Rica).

Audit: The audit report of SIECA for the IR2 for 2000 was approved by RIG. The final audit started November 6, 2001, and will be completed by the end of March 2002.

Disposition of Equipment: The office equipment (4 computers with printers and software licences) has been transferred to the SIECA/Roads office in support of USAID/G-CAP PROALCA II project.

Lessons Learned:

- It was necessary to develop a mechanism to systematize the studies and manuals development work directed at strengthening the road system in Central America in order to avoid "reinventing the wheel" for each time.
- The ministries dealing with roads infrastructure in each country were involved in the development of regulations for the regional roads. This proved to be very important and allowed that all views were taken into account from the beginning and the results were accepted more readily. This IR accomplished this by including representatives from each ministry in the technical groups formed to develop the manuals, and by having these representatives present the manuals at the country presentations.
- A good dissemination of the manuals was felt to be a must in order to avoid having "shelved" manuals at the end of a project. This was accomplish by having one presentation of the manuals in each of the CA countries to a wide audience that included representatives from international donor community, other ministry employees, other government entities, construction chambers, the private sector, and universities. Host-country ministerial representatives involved in developing the manuals gave the presentations.

IR 3: Costa Rican Education System Capacity Upgraded in Selected Communities Affected by Mitch Related Nicaraguan Migration.

The purpose of IR3 was to develop community-oriented education activities that targeted poorer elementary schools with high concentrations of Nicaraguan migrants. The International Organization for Migration (IOM), in collaboration with the Costa Rican Ministry of Education (MEP), implemented the activity.

Key Intermediate Results: (1) Expanding education infrastructure, (2) Improving access to educational materials, (3) In-service teacher and school administrator training, and (4) Strengthened adult education.

Performance: Activities under this IR far exceeded its original goals: more classrooms were built, more teachers trained and more schools included in the program than was programmed.

Highlight: This project was well received by teachers, administrators, parents and students who took it on as their own. In several schools, teachers and administrators have expressed that they will continue using the methods and tools learned during the project. And thanks to the rehabilitation of a classroom that was prepared as a computer lab, the school received a donation of 20 computers from another PVO.

IR 3.1 Expanding education infrastructure: School selection was made using the following criteria:

- Schools with at least 20 immigrant students in 1999
- Schools with 40 students or more per classroom in 1999
- Schools with a higher percentage of immigrant students in 1999

The fact that the infrastructure was done during the first year motivated teachers and administrators who realized that this Project was actually going to implement what it had said it would do.

Actual versus planned results are shown on Table 1 below.

Table 1: IR 3.1 Actual vs. Planned Results

IR 3.1 Infrastructure Component	**Planned**	**Achieved**
New classrooms built and equipped	**210**	**260**
Classrooms repaired	**47**	**120 classrooms repaired and 2 converted to computer laboratories**
Sanitary units built	**45**	**55 built and 2 repaired**

IR3.2 Improving access to educational materials: Schools for this and IR3.3 where chosen using the following criteria:

- Schools with 5% or more immigrant students enrolled in 1999.
- Schools with 30 or more immigrant students enrolled in 1999

Good teaching materials (educational manipulative games) purchased by the project are being used by more than 36,000, surpassing the original target of 15,000. The materials complement the textbooks provided by the Ministry of Education.

The Ministry of Education offered as counterpart funds, 8 books per student, for 15,000 students. The actual number of books distributed, and children served by the Ministry, has not been provided by the Ministry.

The TVs, VHSs and overhead projectors where donated to the 30 schools with the most active and successful participation in the project.

Actual versus planned results are shown on Table 2 below.

Table 2: IR 3.2 Actual vs. Planned Results

IR 3.2 Educational Material Component	Target	Achieved
Purchase and distribution of teaching materials	**For 15,000 students**	**56,000 items distributed in 310 schools for use by at least 36,000 students; 15 TVs, 15 VHSs and 15 overhead projectors distributed**

IR 3.3 In-service teacher and school administrator training: The school selection criteria was the same as for IR 3.2 above.

As Table 3 shows, the achieved results under this sub IR were well above the targeted results. The number of schools included had to be increased due to pressure once other schools learned about the project in already participating schools. Consequently, the number of trainees and participating children also increased.

One of the most exciting areas of the project was the mediation activity implemented in 207 schools in which 7,110 students participated. This activity used 2,400 voluntary parents, teachers and students to provide personalized teaching assistance to children with school difficulties (30% immigrants). As a result, 80% of the students participating in the mediation program improved their academic performance.

Mediation is a social and pedagogical intervention method aimed at producing the necessary changes in people's capabilities that promote self-development and improve living conditions. Mediation attempts to stimulate the thought process and the acquisition of both emotional and cognitive skills. By strengthening self-esteem and renewing

confidence in the learning abilities of unsuccessful schoolchildren, mediation provides an effective means to both stimulate academic performance in affected children and reinvigorate interest in these projects among schoolteachers. It is also a powerful tool to promote voluntary community participation in social projects.

The Costa Rican Ministry of Education provided salaries to teachers and administrators as counterpart funds, and up to a 5% increase in salaries starting in 2002, for teachers and administrators who participated in the training activities and implementation of the programs.

Actual versus planned results are shown on Table 3 below.

Table 3: IR 3.3 Actual vs. Planned Results

IR 3.3 Training Component	**Target**	**Achieved**
Number of schools assisted	**150**	**326**
In-service training for teachers and administrators	**1,500**	**1,665**
Schools with remedial programs	**Not specified in Agreement**	**207 schools with mediation projects**
Students enrolled in remedial programs	**Not specified**	**7,110 (of which 30% were immigrants)**
Volunteers working in remedial programs	**Not specified**	**2,400**
Open classroom programs	**Not specified**	**40**
Students in open classrooms programs	**Not specified**	**3,000 (of which 21% immigrants)**
Design and delivery of modules on diversity, cultural integration and scholastic yield	**Not specified**	**3,000**

IR 3.4 Strengthened adult education: Schools where chosen using the following criteria:

- Communities including schools with 20% or more immigrant children enrolled in 1999.

In the Costa Rica, adult education is administrated and often thought of as a by-product of children's education. The Ministry of Education, the only significant supplier of free-access education, operates adult projects using the same premises and the same structures as those used to teach children. There is scarce organizational interest in serving a potential population almost as numerous as that of high school students. The result is low performance of adult students, high dropout rates, high teaching personnel turnover due to little job satisfaction,. This situation made it very difficult for the Project to raise interest in a

literacy project and once this had been achieved, even more difficult to guarantee any degree of sustainability for the future.

The Project did the following to implement this component:

- It created local alliances between the Ministry's regional offices, which provide technical guidance, and NGOs, which have better capacity than the Ministry to reach the illiterate immigrants located mostly in marginal or remote communities.
- It worked with big employers like Standard Fruit banana farms, which are interested in the adult literacy because it helps them meet social laws.
- It redefined the -literacy program by using basic reading and writing skills to improve everyday life activities such as communication, social and labor integration, and knowledge of human rights for the immigrant population.
- It trained teachers and administrators in basic literacy programs and/or total language methodologies, tailored to adults.

While only 4,200 adults were enrolled in the adult education programs, and the target was 5,000, the Project has built a capacity for executing literacy projects for 9,800 adults, and can be considered a success.

The continuity of this component has been given a chance by having involved 17 NGO´s in its implementation. A total of 80 volunteer teachers of NGOs were trained by the Project in literacy programs.

Actual versus planned results are shown on Table 3 below.

Table 4: IR 3.4 Actual vs. Planned Results

IR 3.4 Adult Education Component	**Target**	**Achieved**
Schools with literacy programs	**Not specified**	**200**
NGOs with literacy programs	**Not specified**	**17**
NGOs volunteer teachers trained in literacy programs	**Not specified**	**80**
Number of adults enrolled in literacy programs	**Capacity for 5,000**	**Capacity for 9,800** 4,200 enrolled
Teachers and administrators trained in literacy programs	**350**	**820**
Materials developed and distributed for literacy programs	**Not specified**	**7,700 workbooks, books and 20,800 visual aids**

Final Report and Audit: The final report was submitted in January 2002, and the project audit will be done by the end of February 2002. A core group of IOM personnel will continue until January 31, 2002 funded by the Grant Agreement to finish these closeout activities.

Disposition of Equipment/Vehicles: The vehicle and office equipment purchased to manage the Project have been transferred to IOM to be used in other US-financed projects.

Lessons learned:

- **Identification of needs:** The fact that the Project responded to difficulties teachers had consciously identified in their daily work was key to their interest in applying the proposed tools (training and materials) and continuing to apply them after the Project is over.
- **School selection:** The fact that schools were chosen to participate on a strictly technical basis, allowed the project to work with a very consistent population profile. The basis was the percentage of immigrant students in the school.
- **Use of a systemic approach:** A well thought-out strategy for project implementation permitted constant feedback and adjustment to the project. During the first year, resources to improve school performance were put in place that included new and repaired classrooms, sanitary units, and training and materials. During the second year, the project concentrated on technical assistance to these schools to optimize application of resources. A team of 30 mediators visited the schools on a weekly basis to provide motivation and assistance to them and feedback to project management (IOM and MEP counterpart), ensuring timely and adequate adjustments to plans and contents. The key to success was the constant presence of the mediators in the schools, which made them part of the school team.
- **Timing and pace control:** A successful implementation of a project of this nature involves adequate synchronization and timing in the execution of the various components and subcomponents in order to produce the desired effects. For example, resources and material were distributed at times of need, or when motivation had to be stimulated. Another example was the need to coordinate a large number of institutions, such as government entities, NGOs, universities, local communities and private enterprise, with different response times, to achieved the expected effects in the field.

  The relatively short period of execution (two years) for a project of this nature was originally a drawback as it imposed a pace that was at first perceived to be too hasty by the state organizations involved, i.e., the Ministry of Education and the University of Costa Rica. In the first months of implementation, several dates had to be rescheduled, which caused uneasiness among participants. However, the quick pace of execution turned into an asset later on, because it facilitated global understanding of the project, its objectives, strategies and methods by the participants, and contributed to creating a climate of coherence and confidence in its capacity and actions.

- **Teamwork:** A deliberate effort was made to build teamwork with all participants, including project personnel, counterparts, target population and suppliers. This approach enhanced creativity and communication, which in turn improved feedback quality, speed and frequency, and change of course, when needed.

- **Consistency, credibility and trust.** Special care was taken to maintain a coherent message with actions. Consistency between promises and facts, theoretical statements and technical practice to build trust and motivation, active collaboration and ownership of

the project, was consciously pursued. This was especially important in an environment where many projects are running at the same time, many go unfinished, many promises go unfilled and strategies change constantly. Constructive team building approaches at all levels of design and implementation, and constant communication were the tools used to achieve this result.

- **Understanding and sensitivity to work with a variety of teams, philosophies and organizational cultures:** This was essential to work with the Ministry's administrative structure and culture in order to create a symbiotic relationship that would increase the probabilities of institutionalizing the activities of the project.
- **Selection of suppliers**: One criterion for selecting universities to develop material and other activities was their willingness to incorporate into their own organizations innovative elements they developed and proposed to the project. This outcome did happen at the National University, which now offers undergraduate students education curricula with intercultural, and adult literacy components.
- **The use of Mediation (remedial education):** This method was instrumental to the success of the elementary school subcomponent. Its application resulted in high rates of participation in training activities (attendance at the last workshop was 100%), few schools dropping out of the project in the second year (only 2), high numbers of voluntary mediators (2,400), and improved school results in 80% of the children that participated. It should be applied more extensively.
- **Use of a variety of training modalities:** The Project developed a very flexible training model that included experience sharing, distance learning and on the job training with the support of team mediators and field promoters. The model responded to conditions in the field such as need to access a relatively large population located in a relatively large territory both rural and urban, with sometimes inefficient communication; a high turnover of teaching and administrative personnel (up to 40% in rural and poorer urban areas); and the fact that the Minister of Education did not allow teachers to participate in training activities during school time.
- **Training strategy:** The training strategy used was effective, and exceeded targets. Participation was high and knowledge acquired was applied in the schools. In the first year, schools were asked to prepare their own recuperation project proposals including training needs, particularly in terms of cultural integration and mediation. Training, donation of educational material, and improvement of school infrastructure were conditioned to the design of the proposals and served as incentives to produce good proposals, which in turn resulted in good training and application results. In the second year educational material was delivered, and technical assistance and complementary training provided, to support and monitor the implementation of the recuperation projects in each school.
- **More training for voluntary mediators:** Voluntary mediators (2,400) received minimum on-the-job training, which proved effective as evaluations show. However more training would have improved their self-confidence and creativity. This training would have been provided if the project had had an extra year.
- **Assess conditions of adult education at project design level:** It would be advisable to assess conditions of literary programs for adults at the design level. If conditions are similar to those described in the section on adult education, structure the project based on stronger participation from universities and civil society.
- **Redefining literacy programs was vital in enrollment results:** Illiteracy is considered a shameful characteristic that adults tend to hide. Redefining the program to use basic

reading and writing skills to improve everyday life activities such as communication, social and labor integration, and knowledge of human rights for the immigrant population, improved enrollment substantially as people could see the use of literacy in improving their quality of life. At the training level, this redefinition helped enrich the teachers' concept of their role towards their adult students, thus improving the quality of their classes.

- **Two years is not enough to guarantee sustainability of the Project:** Although every care was taken to ensure sustainability and the project was been able to build a satisfactory number of sustainable elements, the 2-year period was insufficient time to consolidate the project as a whole and assist the Ministry and school in this task, leaving the investment at risk. An extension or a three-year period in the original design should have been planned for.

IR4: Strengthening regional policies that reduce energy system vulnerabilities to disasters.

This Intermediate Result promoted environmentally sound, cost-effective energy development policies for economic reactivation, and for reducing energy system vulnerability to future disasters. Total funding was $4.2 million.

Key Intermediate Results: (1) Regional energy sharing advanced; (2) Improved efficiency of the energy sector through restructuring; and (3) Promote renewable energy and equity (especially for economic reactivation).

Background: The $4.2 million for this activity was broken down as follows.

- Department of Energy: A transfer of $200,000 was made to the DOE which carried out activities in support of IR 4.1 and IR 4.2.
- NRECA: $1,655,000 was used under a Cooperative Agreement with the National Rural Electric Cooperative Association (NRECA) in support of IR 4.3. Funds were used to install renewable energy systems and extend the grid for rural electrification in Guatemala and Nicaragua.
- PA Consulting Group: A task order for $2,200,000 for an IQC with PA Consulting Group was signed in support of IR 4.1 and 4.2.
- Management: $195,000 was spent on management for the project. A Personal Services Contractor (USPSC) and a Foreign Service National (FSN) were hired to manage IR 2, 3, and 4.

IR 4.1 Regional energy sharing advanced; and

IR 4.2 Improved efficiency of the energy sector through restructuring:

Performance: PA Consulting Group's work met expectations.

This activity was designed to work in two key areas: emergency plans for four countries and promotion of regional power sharing efforts as a means to reduce vulnerability of the energy sector to future disasters.

PA Consulting Group met its target with respect to the first area. It developed draft emergency plans for four countries: El Salvador, Guatemala, Honduras and Nicaragua. These reports include a summary of the current policy and regulatory situation in each country, specific action plans for hydroelectric plants and transmission infrastructure, and proposed regulations, guidelines, standards and codes necessary to adequately ensure disaster resiliency, particularly to flooding. Final plans were completed at the end of December 2001. Under PRAOALCA II, PA will promote the plans.

In the area of regional power sharing efforts, PA Consulting provided TA to the recently created Regional Power Operator (EOR) on regional interconnection issues from the regulatory and operational points of view. PA developed transitional regulations and procedures for the operation of the regional interconnection that were presented by the EOR to the SIEPAC and the IDB. It is expected that interconnected countries will use these transitional regulations and procedures to accelerate regional market energy interchanges. These exchanges are expected to increase, particularly in the North Block (El Salvador, Guatemala, and Honduras) when the new interconnection between El Salvador and Honduras starts commercial operations in early 2002.

Highlight: Comments of EOR members are that this activity has helped them move forward more in one year than they have in the previous ten.

Highlight: The technical assistance provided under this task helped maintain a steady flow of electricity between Guatemala and El Salvador after the earthquakes of January and February of 2001 in El Salvador.

Lessons Learned:

- **Consulting team with previous experience:** The key for success, due to the limited time available for the project, was the use of a consulting team that was already working on the subject, was already doing a good job, knew the situation in each country and had close relationships with the Central American governments counterparts.
- **Divide and Conquer:** With six countries in Central America involved (Costa Rica, Panama, Nicaragua, Guatemala, El Salvador, Honduras) in the regional power sharing efforts, with private and public sector representatives competing with each other, and with very different energy sector models in each country and at different stages of restructuring, the only way to have some consensus was to work out issues between two neighboring countries at a time and develop "transitory" rules for the Regional Energy Market Operator (EOR), so that the regional electricity transactions could start. A global solution to all issues by all countries and all interested players was not possible at this point and would have continued to paralyze the regional market sharing effort.
- **There is still a lot to be done in the area of disaster preparedness in Central American countries**: The work done to develop the emergency plans showed that there are about four to six institutions in each country involved in emergency situations with unclear areas of responsibilities and commitment and that though each country has different levels of sophistication in dealing with emergencies, none has a

systematic approach identified which became the focus of the effort. The plans identify areas of weakness in the system in each country, and identify specific areas which lack methodology and procedures to deal with a natural disaster such as a flood. The plans focus on the operation of one hydroelectric power plant and transmission lines for each country because of the enormity of the problem. Some electric utilities in the region have expressed their interest in applying the same methodology in other hydropower plants. The plans are only the first step to reduce power sector vulnerability to natural disasters.

IR 4.3 Promote Renewable energy and equity:

Performance: NRECA completed and surpassed the original targets set for work under the RREICA Program in Guatemala and Nicaragua.

Highlight: NRECA responded with incredible speed when a health project under the Nicaraguan mission needed photovoltaic systems to be installed in about 74 health units and medical housing. The installation was implemented in record time from mid-August to December even with a two-week stop in activities because of presidential elections.

Electrical Connections and Photovoltaic Systems: The main goal of the RREICA program was to benefit at least 2,000 families with reliable electric service using a combination of grid and renewable technology. By 31 December 2001, the total was 2,045. It is of interest to note that, thanks to the Mitch funding and the effective leveraging by NRECA of counterpart contributions, another 815 families will soon enjoy electricity. Some projects complemented current income-generation activities. These activities will use electricity for activities including water supply, irrigation, agricultural processing, and support of small businesses.

The original Cooperative Agreement called for a total of up to 10 photovoltaic (PV) systems for both Nicaragua and Guatemala, but 97 where installed at the end. In Guatemala a total of 16 PV systems were installed, all in schools. In Nicaragua, 7 photovoltaic systems were originally programmed. USAID/Managua asked USAID/G-CAP to assist in installing 72 PV systems in health posts and medical personnel houses built or rehabilitated under its Mitch PROSALUD project. USAID/G-CAP was able to reassign $105,000 of regional Mitch project funds and USAID/Managua reprogrammed $50,000 of its Mitch funds. By the end of the project a total of 81 photovoltaic systems had been installed (50 health posts, 27 medical staff houses, and 4 other applications). Data obtained from the Ministry of Health in Nicaragua and from villagers indicate that a total of 270,577 people live in the areas served by those sites.

Identification of Projects and Contact with Other Development Partners: More than 130 potential project sites were identified for the RREICA Program. Much of the identification process and coordination leading up to final selection of those projects actually executed was done in conjunction with other development partners involved in hurricane recovery activities. Through many phone conversations, meetings, and field visits NRECA coordinated with a total of 18 organizations working in areas where there were existing income generation and/or hurricane recovery activities.

Training: NRECA provided training to linemen, electricians, photovoltaic system installers, and end users. A total of 370 individuals received training during 101 training activities that ranged from short sessions on how to operate a photovoltaic system to an entire week of on-the-job training in line construction. Basic training in the use of electricity was provided by printed materials and community meetings.

Audit: NRECA/RREICA's final audit report will be available at the end of March 2002.

Counterpart Contribution: By the end of the project the match amount reached $673,750 far surpassing the $180,600 that NRECA committed to in the original Cooperative Agreement and the Amendment.

Lessons Learned: An evaluation of the RREICA Program was performed by independent evaluators and the following section regarding lessons learned is quoted from their report:

- NRECA's fourteen year's experience with rural electrification in Guatemala, its excellent relationships with municipalities and communities, its willingness to collaborate closely with other NGOs, and the application of creative and effective time-saving procurement and management procedures made it possible to complete grid extension projects in 18 months and community PV projects in 6 months. However, because NRECA's project preparation work was funded by NRECA itself outside the RREICA Program budget but was critical to rapid project execution, the Program budget under-represents the true financial cost of carrying out the Program. Also, it is likely that costs per connection ratio could have been lower with a longer project time frame in which more households could have afforded house wiring costs.
- Community involvement at the site-selection phase and in co-financing electrification costs can expedite the Program and be expected to help in its long-term sustainability. However, this requires considerable coordination effort and can be expected to work smoothly only when the implementing organization is considered trustworthy and has established a long-term relationship with municipalities and local organizations.
- Without written agreements with Unión Fenosa and other power suppliers fixing construction standards for the duration of the Program, they can be expected to change the standards, requiring expensive changes during Program implementation to meet these new standards.

Financial Summary

As of December 31, 2001, USAID/G-CAP had sub-obligated 100% of funds under the four intermediate results (see table attached). Accrued expenditures for all four IRs had reached 97.46 %, i.e., $13.141 million (see graph). This is a bit deceptive in that $2.0 million under IR1, had been transferred at the beginning of the program to NOAA and USGS directly to their respective Inter-Agency Agreements (632a). Consequently, those agencies are responsible for reporting those expenditures, i.e., what appears to be a $251,000 shortfall. This amount will be reported in NOAA's and USGS's final reports to USAID/Washington. Beyond that, some administrative costs related to close out and final report preparation are allowed and will be liquidated by March 31, 2002.