PRIDE Project in Development and the Environment

Comparative Risk Assessment for Central America:

Executive Summary

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The objective of the Project in Development and the Environment (PRIDE) is to help the U.S. Agency for International Development (AID) design and implement programs that foster the agency's environmental and natural resources strategy for sustainable economic growth in the Near East and Eastern Europe.

PRIDE provides AID and participating countries with advisory assistance, training, and information services in four program areas: (1) strategic planning, (2) environmental policy analysis, (3) private sector initiatives, and (4) environmental information, education, communication, and institutional strengthening.

The project is being implemented by a consortium selected through open competition in 1991. Chemonics International is the prime contractor; subcontractors include RCG/Hagler, Bailly, Inc.; Science Applications International Corporation; Capital Systems Group, Inc.; Environomics, Inc.; Industrial Economics, Inc.; Lincoln University; and Resource Management International, Inc. In addition, AID has entered into a cooperative agreement with the World Environment Center to support implementation of PRIDE.

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By:

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EXECUTIVE SUMMARY

The Comparative Risk Analysis (CRA) project is an initiative of the Central American Commission for Environment and Development (CCAD) and the United States Agency for International Development (USAID). The project is financed by USAID through the Regional Environmental Project for Central America (PROARCA). It is a part of the environmental protection component of PROARCA, which provides technical assistance on pollution control to the countries in the region. Technical assistance under this component of PROARCA may be provided by Central American experts, personnel from the United States Environmental Protection Agency (USEPA), and USAID contractors. The CRA project is managed by the Project in Development and the Environment (PRIDE), a centrally funded USAID project that provides technical assistance in environmental and natural resources management to USAID missions and host country institutions.

CRA is a process for identifying and prioritizing environmental problems and developing potential solutions to those problems. The CRA project applied the process to Central America[1] to identify and prioritize the most severe pollution problems in the region, to identify viable strategies for reducing the environmental risks posed by high priority problems, and to select a limited number of strategies for implementation. The selection of strategies for implementation was based on assessments of potential effectiveness, available financial resources, and institutional capabilities.

Implementation of the CRA project was highly participatory. The project hosted 17 meetings and workshops, with participation by over 300 professionals from national government agencies, municipalities, industry, nongovernmental organizations (NGOs), community groups, and universities. The participants in these meetings and workshops were supported by CCAD and the project staff. This participatory approach has resulted in a truly Central American product, reflecting the consensus of environmental professionals from across the region.

This Executive Summary in English is a brief of the CRA project document, published by PRIDE in Spanish in three volumes. The first volume presents the principal results of the project, including the regional prioritization of problems, identification of strategies to address those problems, development of action plans, environmental legislation needs, and potential sources of financial support. Volume Two contains country profiles prepared for use in the risk assessment phase of the project and the third volume describes the participatory process used in comparative risk assessment.

A. General Information on the Region

The six countries included in the CRA project have a land area of approximately 486,900 square kilometers. The region has a population of nearly 31 million persons, with 46 percent of the inhabitants living in urban areas and 54 percent in rural areas. The region has 21 cities, each with more than 100,000 inhabitants. Only two cities in the region have populations over one

[1]The Central American countries participating in the CRA project were Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama. All of the countries in Central America were originally included in the project, but Belize chose not to participate.

million (San Salvador with a population of 1.5 million and Guatemala City with a population of 1.1 million).

Although the economy of the region has been improving during the past ten years, per capita Gross Domestic Product (GDP/c) remains quite low. The highest GDP/c in the region is in Panama ($2,257) and the lowest is in Nicaragua ($512). Agriculture is the principal economic activity in the region, although the industrial sector has been growing in recent years.

All of the countries which participated in the project have a ministry, secretariat, institute, or commission charged with oversight of environmental protection[2]. In every country, though, more than one governmental institution is involved in environmental protection. For instance, each country has an agency other than the oversight institution responsible for wastewater service, and the registration and control of pesticides are the responsibility of the Ministry of Agriculture.

B. Evaluation of Pollution Problems

The CRA project collected information on and analyzed seven pollution problems in the region: air pollution, contamination of drinking water by such pollutants as lead, wastewater, solid waste, pesticides, and other contaminants. Project staff made ten trips to the region to collect information on these problems in each country. The quantity and quality of available information varied widely from country to country and from problem to problem. Often the information was dispersed among various government institutions, making access difficult. In many cases, only qualitative information was available.

In many CRA projects large amounts of quantitative data can be used to assess environmental risks and prioritize environmental problems. In Central America, though, limited quantitative data were available on several contamination problems, especially in terms of air pollution and lead. The large participatory process through which the CRA project was carried out in Central America overcame the data gaps. Project staff complied information and data for each problem area in each country and used a relative scoring system to estimate potential risks and rank each problem. They assigned individual scores for the intensity and scope of each problem regarding impacts on human health, quality of life, ecosystems, and the trend of the problem. The scores and information supporting them were presented at six awareness meetings, one in each country. Attending were environmental professionals representing governments, industries, universities, community organizations, and environmental NGOs. During the awareness meetings, the participants reviewed, and in some cases revised, the scores for each of the seven problem areas, applying the same criteria used by the project staff.

The results of the problem rankings are shown in the following table.

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[2]MINAE in Costa Rica, SEMA in El Salvador, CONAMA in Guatemala, SEDA in Honduras, MARENA in Nicaragua, and INRENARE in Panama.

Ranking of Pollution Problems						
Country	**Problem No. 1**	**Score**	**Problem No. 2**	**Score**	**Problem No. 3**	**Score**
Costa Rica	Air Pollution	10.0	Wastewater	9.0	Pesticides	9.0
El Salvador	Wastewater	16.5	Pesticides	12.5	Solid Waste	12.0
Guatemala	Wastewater	9.5	Solid Waste	9.0	Pesticides	7.0
Honduras	Wastewater	15.5	Solid Waste	14.0	Pesticides	12.5
Nicaragua	Wastewater	9.5	Solid Waste	7.5	Pesticides	6.5
Panama	Solid Waste	13.0	Pesticides	12.5	Wastewater	11.5
Note: The scores were developed independently for each country. They can be compared across problems within a country, but they cannot be compared across countries.						

In Central America, inadequate collection and treatment of wastewater and solid waste are major causes of environmental degradation. The severity of the situation can be seen in the lack of service provided. For example, 37 percent of the population in the region has no access to wastewater collection and treatment. The percentage of the population without access to wastewater systems is higher in rural areas (62 percent) than in urban areas (8 percent). Although 63 percent of the population is served by wastewater systems, this is not an indication that 63 percent of the wastewater is adequately treated before being discharged into the region's waterways. Many of the wastewater collection systems discharge effluent without treatment. Most of the existing wastewater treatment plants are obsolete, overloaded, and poorly maintained and operated. As a result, wastewater is a primary source of surface water and groundwater contamination in the region.

In urban areas, only 50 to 80 percent of the solid waste generated is collected, and collection is virtually nonexistent in peri-urban and rural areas. Uncollected solid waste is disposed of in the streets, vacant lots, and illegal dumps (often located in drainages and on the banks of rivers). Even the solid wastes that are collected often are disposed of in open dumps with no provisions for soil cover or control of leachate and methane production. The region has only a few programs for separating hazardous wastes from nonhazardous wastes few formal recycling programs. As a result of the lack of solid waste management, the general population is exposed to pathogens and toxic substances. Solid waste workers and Scavengers,@ who are involved in informal recycling, are at particular risk.

The lack of wastewater and solid waste collection and treatment contributes to public health problems in the region. Health indicators for morbidity and mortality from waterborne diseases are high throughout the region. For example, illnesses associated with acute diarrhea are the principal cause of mortality for infants and young children in Guatemala. In El Salvador, 60 percent of infant mortality is due to parasites and infections. In Honduras, 5 percent of the population reported cases of diarrhea in 1988.

Pesticides are another major source of environmental contamination throughout the region, primarily because of improper use. Agriculture is the principal economic activity and agricultural production depends heavily on pesticide use. Little investment has been made in Central America to develop agricultural systems less dependent on pesticides, such as organic farming and integrated pest management.

Air pollution is another significant problem, primarily in the large urban centers. The principal source of air pollution in urban areas is vehicle emissions, and few vehicles of the

region have any type of emission control. Compounding the lack of emission control are inadequate traffic control, the high percentage of older vehicles in the fleet, and the use of leaded gasoline. Stationary sources also contribute to air pollution in Central America, with the principal sources being pharmaceutical manufacturers, agrochemical producers, metal fabrication, and agroindustries.

Wastewater, solid waste, pesticides, and air pollution have caused severe environmental problems in Central America, particularly with regard to contamination of surface water, groundwater, soil, food products, and air. This contamination has in turn damaged human health and ecosystems, reduced the quality of life, and impacted the economies of the countries in the region.

C. National and Regional Strategies

The CRA project hosted six national workshops to develop viable strategies for reducing the environmental risks posed by these priority problems. More than 150 environmental professionals participated in the workshops, where they identified potential strategies and then evaluated them using criteria developed by the project staff. Criteria included potential risk reduction, total cost, cost-effectiveness, and equity. The participants also identified institutional responsibilities for each proposed strategy and assessed institutional capacity and legal needs for implementation. Using these criteria and assessments, the participants developed a list of viable strategies. From this list, they identified six strategies (two from each of the top three problem areas) and, in some cases, pilot programs to be developed further and considered in the regional action plan.

To facilitate the ongoing development of strategies, project staff created technical committees at each national workshop. Structured to ensure multi-sectoral representation, they included members from national government agencies, municipalities, the private sector, academic institutions, and NGOs. The technical committees met after the national workshops to finalize strategies and to advise the project staff on project implementation.

The results of the six national workshops and subsequent work of the Technical Committees were compiled for use in development of regional action plans. Strategies considered in the action plans were divided into three broad program categories: development of municipal government capacity, capital investments, and capacity building and education. The following table presents a summary of the regional strategies developed at the national workshops.

Regional Strategies Developed at the National Workshops	
Program I	**Wastewater**
Municipal development	**Objective:** To improve the capacity of municipal governments to: a) Manage finances (improve management of available resources and develop capacity to set rates to account for the costs of providing service, including environmental costs) b) Identify low cost technologies c) Identify appropriate technologies d) Develop systems to control and monitor water quality e) Develop legal and regulatory frameworks f) Design and manage projects (including feasibility studies and technical design) g) Design, construct, manage, operate, and maintain wastewater systems

Capital investments	**Objective:** To secure and manage capital investments to: a) Increase sewerage coverage and improve wastewater treatment b) Improve wastewater systems in areas not served by sewers c) Introduce alternative treatment technologies such as septic tanks, constructed wetlands, biofiltration) d) Promote technologies and systems which create economic benefits from wastewater treatment by-products e) Introduce new technologies for reducing risks from standing water—a breeding ground for vectors, odors, and pathogens
Program II	**Solid Waste**
Municipal development	**Objective:** To improve the technical and managerial capacity of municipal governments to: a) Train municipal workers in the proper collection and disposal of solid wastes b) Manage finances (such as cost recovery for solid waste management, design and application of cost management programs, tax and fee collection, municipal budgeting) c) Create incentives and disincentives to encourage participation by various economic sectors in solid waste management d) Increase municipal service delivery for collection and treatment of solid wastes (such as loans and rotating funds) e) Develop solid waste codes and regulations (such as waste classification and penalties) f) Support the creation of local organizations (cooperatives and small businesses) to collect and reuse recyclable solid wastes through the use of financial and nonfinancial incentives (such as grants, low or no interest loans, and technical assistance) g) Support the creation of private enterprises for collection and disposal of solid wastes through the use of patent laws, tax relief, and the creation of special funds h) Identify low-cost technologies for collection, management, and disposal of solid wastes, adopting alternative models for the management of wastes including labor intensive management of sanitary landfills i) Develop demonstration projects for solid waste management j) Develop monitoring systems capable of determining the efficiency of solid waste management programs k) Develop the ability to secure national and international funding and technical assistance for project implementation

Capacity building and education	**Objective:** To promote capacity building and educational programs directed at primary and secondary solid waste producers, community organizations, NGOs, local leaders, religious leaders, civic organizations, and the general public relating to: a) The costs and benefits of solid waste management using mass communication b) Minimization of waste production using training and demonstration projects
Program III	**Pesticides**
Capital investments	**Objective:** To secure and manage capital investments to: a) Develop and implement locally appropriate alternatives to pesticide use including agroecology, organic farming, and integrated pest management b) Minimize pesticide use and reduce farmer dependency upon pesticides c) Develop mechanisms for enforcing pesticide laws and regulations
Capacity building and education	**Objective:** To promote capacity building and educational programs directed at small farmers; agricultural workers; extension agents; pesticide producers, distributors, and retailers; and the general public (housewives, students, adults, teenagers, children) relating to: a) Promote the use of pesticides and reduce reliance on pesticides through such measures as organic farming and integrated pest management b) Utilize new technologies for producing crops c) Reduce levels of pesticide residues in food These activities will be implemented by government extension agents, agroindustrial companies and organizations, farmers' organizations, academic institutions, the media, NGOs, and development organizations.
Program IV	**Pilot Program in Environmental Management in Costa Rica**
Municipal development	**Objective:** To help municipal governments create and operate Regional Environmental Councils, as provided for in the Organic Environment Law, with the following: a) Representation from municipalities, development agencies, student organizations, NGOs, and national government agencies b) The capacity to promote the use of clean technologies (using, for example, green certification, reduction of import taxes on clean technologies, and other financial incentives to reduce the cost of using green technologies)
Capital investments	**Objective:** To install clean technologies in selected industries (such as the National Cement Factory)
Capacity building and education	**Objective:** To develop and promote the use of environmental curricula in primary and secondary schools and universities, with particular emphasis on air pollution

Environmental laws, incentives, and monitoring	**Objective 1:** To develop mechanisms for monitoring and enforcing existing environmental laws, with particular emphasis on: a) Improved implementation of the Organic Environment Law b) Establishment and operation of Regional Environmental Councils c) Strengthening the National System of Civil Environmental Defenders d) Activation of Environmental Tribunals In addition, incentives should be created which: · Stimulate the creation of alternatives for the current mass transportation system · Improve and optimize the use of private vehicles
National policies and organizations	**Objective:** To promote the development and adoption of national policies which would: a) Encourage the development and use by private industry of technologies which reduce pollution and/or recover and recycle contaminants b) Define sustainable development and encourage its application
Program V	**Pilot Program on Environmental Incentives in El Salvador**
Environmental laws, incentives, and monitoring	**Objective:** To strengthen enforcement of existing environmental laws and regulations and create incentives for environmental monitoring based on: a) The polluter pays principle b) Internalization of the costs of contamination These activities will be primarily directed at major polluting industries which can upgrade their equipment or convert to clean technologies, incorporating the use of discharge limits and emission fees.

D. Action Plans

The action plans were developed at the Second Regional Workshop, attended by 20 representatives from the technical committees and more than 20 representatives from regional organizations and donor agencies. Participants developed short-(six months to one year), medium-(one to three years), and long-term (three to six years) action plans for the regional strategies developed at the national workshops. For each action in the plans, participants identified institutional responsibilities, possible problem areas, potential sources of funding, and legislative needs. participants in the Second Regional Workshop also developed the following general recommendations:

- Regional institutions, such as Central American Commission for Environment and Development (CCAD), CAPRE, FEMICA, and OIRSA, should pursue financial and technical support for implementation of action plans developed by the CRA project.

- Representatives from national environmental agencies and organization and international donor and development agencies should meet together at regional and national workshops to discuss contamination problems and solutions. A regional entity, such as CCAD, should pursue funding for such workshops and serve as host. Other regional organizations focused on individual environmental problems, such as CAPRE, FEMICA, and OIRSA, should be involved in the workshops.

- National CCAD representatives and national representatives from other regional organizations should meet with country representatives from donor agencies that may have the capacity to finance construction of wastewater and solid waste facilities and thus could assist in implementing programs to control air pollution and contamination from pesticides.

- Within the action plans are crosscutting priority actions such as development of low cost technologies, technical training, institutional capacity building, and establishment of institutions capable of monitoring the environment. Each country, and eventually each municipality, will have to establish its own priority for implementing these actions, particularly as such programs are funded at the regional level by international donors. The national CCAD representatives should take the lead in helping each country and municipality identify and prioritize its needs for these activities. Other regional organizations involved in some aspect of environmental protection, such as FEMICA, CAPRE, OIRSA, FEMICA, CIRSA, ICAITI, and FEDEPRICAP should also assist in setting priorities within their areas of expertise.

E. Environmental Legislation

The Central American countries have made great advances in the promulgation of environmental legislation; however, gaps remain in the legislative programs to protect the environment. Among the needs for environmental legislation are creation of regional harmonization of environmental laws, strengthened regulatory mechanisms and standards, increased institutional capacity to write and enforce laws, development and implementation of incentives for compliance with environmental laws, and improved municipal codes to address environmental issues or activities impacting on the environment.

The PROARCA program includes an activity with USEPA to provide technical assistance in the formulation and implementation of environmental legislation and regulation. This activity has five basic components:

- Strengthen the capacity of institutions responsible for protecting the environment

- Help develop environmental laws and mechanisms for their implementation and enforcement

- Strengthen enforcement capabilities

- Facilitate public participation in the development and implementation of environmental policies, laws, and regulations

- Facilitate development of environmental assessments that can be incorporated into the decision-making process.

In carrying out its activities, USEPA will strive to integrate consideration of legal and enforcement issues into regional environmental activities. It will also help establish a network of environmental law experts in the region.

During implementation of the CRA project, and particularly during the awareness meetings and national workshops, participants identified environmental legislation needs for priority environmental problems. With regard to wastewater and solid wastes, these needs are:

- Adopt legislation directed primarily at industrial discharges
- Strengthen enforcement and develop mechanisms for enforcement
- Use monitoring as a mechanism for enforcement.

With regard to pesticides, the legislative needs are to improve existing legislation, including the development of regulations governing the use and monitoring of pesticides. The most pressing legislative need with regard to air pollution are improved enforcement and the creation of incentives for improving public transportation and private vehicle use.

In addition, several general environmental legislative needs were identified:

- Regional harmonization of environmental standards

- Capitalization of present efforts by regional organizations such as CCAD, CICAD, and OIRSA to strengthen legal frameworks enforce environmental laws, and increase technical assistance from donor agencies such as USAID, the Inter-American Development Bank (BID), and the World Bank develop environmental legislation.

Participants in the CRA project were particularly interested in focusing the efforts of PROARCA, through its agreement with USEPA, on the priority problems and legislative needs that they identified. These actions should be pursued by CCAD in coordination with CICAD and OIRSA.

F. Sources of Funding

The CRA project developed a matrix of possible funding sources for implementing the action plans. The matrix contains information on donor agency, country receiving funding, project name, objective, implementing agency, and project budget. The objective of the matrix is to identify current environmental activities funded by international donor agencies as a means of determining their environmental funding priorities. The matrix was used at the Second Regional Workshop to help identify those action plans with the greatest potential for donor support.