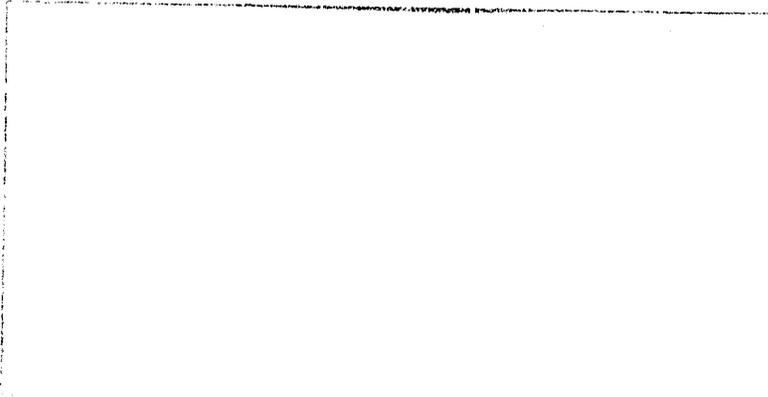


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**THE COUNTRY ENVIRONMENTAL PROFILE:  
PROCESS AND PRODUCT**  
An Evaluation of Profiles Conducted  
Prior to 1983 and Recommendations  
for Improvement

Joshua C. Dickinson, III  
January, 1984

936

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Country Environmental Profiles:  
An evaluation of the process and products

1.0 Summary

Country Environmental Profiles have been prepared for more than 40 countries in which AID has activities. These documents provide accurate and useful information about the country, its natural resources, their use and associated problems. Profiles have been used as briefing documents and reference works by AID Missions, host governments and other donors. Phase I Profiles based solely on library research are being followed by more detailed Phase II Profiles prepared by interdisciplinary teams working in the host country. These field studies have provided justification for major natural resource management projects financed by AID, contributed to institutional development and provoked considerable local discussion of environmental issues. The Profile process has inspired or reinforced similar efforts by World Bank, the International Union for the Conservation of Nature and Natural Resources (IUCN) and the UN Environment Program.

AID is the first development assistance institution to undertake the complex task of carrying out Environmental Profiles around the globe. Lacking methodological precedents, both the process and products reflect considerable experimentation. Phase II field Profiles have been conducted by expatriate consultants as well as by teams organized and directed by local private organizations. Much has been learned in the past four years. This pioneering experience is the basis for the recommendations contained in this report.

A thorough evaluation of both the process and the published Environmental Profiles has resulted in recommendations for improving the structure, content and utilization of future Profiles. These recommendations are summarized below:

1. Greater emphasis should be given to the process of profiling; substantive involvement of host country institutions and AID personnel as well as consultants. This has had a significant multiplier effect on the value of the published product.
2. Substantial investment in a quality product justifies the publication of far more copies of Phase II Profiles. This has been a major limiting factor on Profile utilization by professionals, educators, citizens and the donor community.
3. In addition to its valuable role as a data compendium and in problem identification within each natural resource sector, future Profiles should include a holistic synthesis analyzing development opportunities and the

consequences of often conflicting sectoral activities.

4. Profiles should be conducted in all countries where AID is active. Institutionalization of an updating process should also occur. Profiles should become an integral part of the Mission development project planning process with a direct input reflected in Country Development Strategy Statement and subsequent actions.

## 2.0 Scope of Work and Program

- 2.1 Analyze past Profiles in the context of their stated objectives addressing their development, problems, strong points and use. Included are a document review, telephone interviews and face to face discussions. Three countries are to be visited where Profiles have been carried out.
- 2.2 Recommend improvements in Environmental Profiles including organization, structure, process and content. Guidelines should be sufficiently generic and flexible to apply to a variety of situations in countries served by AID. The purpose of recommendations is to enhance the contribution of Profiles to sustainable development.
- 2.3 The program included:
  - a) Initial discussions and interviews in Washington, D.C. including meetings with all regional bureau Environmental Officers.
  - b) Review of existing Profiles and related documents.
  - c) Three-day visits to the Dominican Republic, Ecuador and Honduras to discuss the Profiles and their utilization with AID staff, governmental officials and PVO representatives.
  - d) Review of the draft report in Washington, D.C. with AID, international development assistance organizations and PVOs.
  - e) Approximately 60 person/days of direct contracted effort were devoted to the project in addition to many hours of backstopping and interviewee time.

## 3.0 Country Environmental Profiles-Background and Goals

### 3.1 Background

Environmental Profiles are an integral part of overall AID policy recognizing "that the achievement of long-term benefits to the world's poor, whether they be in urban or rural settings, must be based on environmentally sound planning and on a clear understanding of a country's natural resource potentials and limitations. The natural resources of LDCs are today subject

to stresses of unprecedented magnitude. These pressures are brought about in large part by rapid population growth which results in increasing numbers of poor people struggling for food, fuel and other necessities of life. Because the health, nutrition, and general well-being of these people is directly dependent on the integrity and productivity of their natural resources, the capability of governments and of the people themselves to manage their resources effectively over the long term is of paramount importance. The effectiveness of the Agency's policy and strategy in support of family planning activities in developing countries is critical to the achievement of the Agency's goal in this area as well" (PD-6, 1983, p. 1).

The concept of Country Environmental Profiles (CEPs) evolved in 1977 and resulted in the initiation of the two-step profiling process in early 1979. The first desk study for Bolivia was followed by a Phase II field study later the same year (Freeman, 1980). Phase I desk studies have now been conducted on some 47 countries primarily by the Library of Congress or the Arid Lands Information Center of the University of Arizona (Figure 1). Follow-up Phase II field studies are in progress or have been conducted in 12 countries (Table 1). The major effort to date has been in Latin America where 7 Phase II Profiles have been published.

The majority of the Profiles to date have been carried out by interdisciplinary consultant teams. These teams spend up to six weeks in the country interviewing and reconnoitering selected areas with host country professionals and AID staff. Exceptions have been Turkey and Ecuador where national PVO's conducted the Profile and Belize and Costa Rica where local consulting firms coordinated the Profile with expatriate consultant input.

### 3.2 CEP goals

Variousy stated in Statements of Work, the goals, general objectives and purpose of the Country Environmental Profiles are:

1. To identify major existing and potential problems and areas of concern for natural resources and environmental management;
2. To stimulate action on environmental problems;
3. To pull together in one definitive document information, data and analysis on environmental problems;
4. To identify possible environmental improvement programs and projects that could be financed by the government and/or the private sector with financial assistance from AID and other donors.



Table 1

## Phase II Profiles conducted 1979-1983

<u>Country</u>	<u>Fieldwork Date</u>	<u>Publication Date</u>	<u>Contractor</u>	<u>Approximate Cost</u>
Bolivia	6/79	7/80	JRB Associates, Inc.	\$ 50,000
Panama	3/80	8/80 (Available 5/83)	ISTI, Inc.	66,000
Turkey	8/80	1981	Environmental Probs. Foundation of Turkey	24,000
Dominican Republic	9/80	7/81	JRB Associates, Inc.	69,000
Honduras	7/81	8/82 (Available 9/83)	JRB Associates, Inc.	75,000
Zaire	7/81	1982	Harza	85,000
Ecuador	1980	1981 (Prel.) 1984 (Final)	Fundacion Natura	130,000
Costa Rica	11/81	12/82 (Available 9/83)	Tropical Science Ctr.	58,000

The first three goals have been the primary focus of Profiles to date. Recommendations for future Profiles will call for the redefinition of "environmental" problems as constraints on development. Major attention will be focused on how the environmental sciences can also make positive contributions to sustainable development.

Of the four goals, the last one, project identification, has never been attempted and in retrospect is considered by AID and others to be more appropriate as a separate task distinct from the profiling exercise. Project identification already has a place in the formal project cycle in each AID Mission.

#### 4.0 Evaluation Strategy

##### 4.1 Issues for discussion

The following list of questions provided the common basis for open-ended interviews, both face to face and by telephone. A list of the persons interviewed is found in Appendix 1. The first seven questions are a retrospective on Phase II Profiles to date and the second set addresses the refinement of future Profiles.

##### Issues for discussion - CEPs to date

1. How does the CEP substantively contribute to AID's mission in the country (by sector and overall)?
2. How does the CEP substantively contribute to the national government's development activities?
3. What are specific examples of actions, policies, projects, etc. which can be attributable directly or indirectly to the CEP?
4. What specific elements of the AID CDSS and the country's national/regional development plans can be attributed to the influence of the CEP?
5. Describe the process by which the CEP was carried out including (a) AID's personnel allocation, liaison with the host institutions, (b) AID and host government actions prior to consultant teams arrival (if applicable), and (c) level and nature of cooperation among consultants, host country people and AID staff.
6. Following publication of the CEP, what actions were taken by AID and host country counterpart institutions to achieve maximum exposure for the document?
7. Problems or drawbacks of the CEP
  - (a) Political problems or sensitivity created by CEP
  - (b) Financial problems due to the funding mechanism
  - (c) Difficulties due to either the contractual mechanism (IQC, etc.) or specific contractors (delays in publication, etc.)

### Issues of interest in future Profiles

1. How can the Profile itself and the profiling process be made more "user friendly" to agronomists, economists and planners in AID and in the national government?
2. What does each sector (agriculture, education, health, etc.) in both AID and the country need to know about the status of natural resources?
3. What should AID and national planners know about the country as a system in order to minimize intersectoral conflicts and optimize development?
4. How can the issues of sustainable human carrying capacity be addressed by the health sector jointly with the agricultural and other natural resource sectors?
5. How can Profiles more effectively address the issue of the quality of the urban environment, per se, and in its interactions with its hinterland (resource requirements, waste discharges and rural-urban migration)?
6. How should Profile data collection and display facilitate periodic monitoring and update of environmental information? This could include monitoring changes in environmental parameters as well as qualitative measures of progress on policy recommendations, projects and in changing public attitudes toward environmental management.
7. Based on experience to date, what should be the appropriate roles of the following entities in the future -

AID Mission

AID/WDC

Host country institutions

Local and international NGO's

Public participation

#### 4.2 Hypotheses

1. That knowledge of a nation's environment; the structure and functioning of its interacting natural, managed and urban-industrial components; is essential to development.
2. That such environmental knowledge can be used to enhance the sustained productivity of goods and services and minimize the conflicts which development sectors generate for each other.
3. That a Country Environmental Profile, properly designed and elaborated by a ~~committed~~ AID, host country and consultant team can make a significant contribution to sustained development.

## 5.0 Case Studies

Three countries were chosen for site visits and in-depth interviews; the Dominican Republic, Ecuador and Honduras. The Profiles done in the Dominican Republic and Honduras are similar, the significant difference being the greater AID mission commitment and local involvement in the Dominican Republic relative to Honduras. The Ecuadorean case is distinct. There the Profile was used as an institution building device with the document being prepared by national experts. For these three countries the Country Development Strategy Statements (CDSS), Annual Budget Submissions (ABS), and various project papers were evaluated to determine relationships to the Profiles.

### 5.1 The Dominican Republic

#### 5.1.1 The CEP process

Growing concern over natural resource degradation led to the preparation of an AID Project Identification Document (PID) in 1978 on the topic of Natural Resource Management. Hurricanes David and Frederick in 1979 caused dramatic human suffering and massive erosion on an already degraded landscape. This served as a catalyst for government and AID support for a Country Environmental Profile (CEP) which in turn helped to justify the Natural Resources Management Project and a later Forest Management Project with AID Washington.

The Dominican Republic Profile is distinguished by the degree of commitment and preplanning devoted by the Mission Director and Agricultural Officer. Prior to arrival of the multidisciplinary consultant team, a coordinator had been named in the Subsecretariat of Natural Resources (SURENA) of the Ministry of Agriculture. Counterparts in agriculture, forestry natural parks and other areas were identified. During periods of from three to five weeks during September and October, 1980 the team and counterparts carried out intensive field reconnaissance and interviews.

Each team member prepared a "sector report" for his area of specialization. The team leader then edited the reports and prepared an introduction and summary. The major chapter headings were:

Natural Vegetation

Plantation Forestry

Water Resources and Watershed Management

Soils

Coastal and Near-Shore Marine Resources

Wildlands and Wildlife

Small Farmers

Pollution

Institutional analysis

This draft CEP was then reviewed by AID and the Dominican counterparts and a final document published with a date of July 1981.

The Dominican Profile was masterfully promoted by AID and SURENA. The Team Leader presented the study results to the President and cabinet at the request of the Minister of Agriculture, a newspaper published extensive parts of the Profile serially and the results became an issue in the 1982 presidential election campaign.

As in the case of other Profiles reviewed, the number of copies printed, especially in Spanish, were grossly inadequate to meet the potential demand by professionals, schools and citizens not to mention potential users outside the country. The first printing was largely absorbed by Ministers and Directors with few left over for professionals. A second printing is now out, long after the interest and enthusiasm has died down.

#### 5.1.2 Accomplishment of stated objectives

Objectives 1 and 2: . . . to define environmental problems and trends, especially those related to the small farm r, and, to compile in one definitive document the information, data and analyses concerning environmental problems.

The environmental problems of the Dominican Republic have been thoroughly documented and described in the Profile. In each of the problem categories such as deforestation, erosion and water resource degradation, a trend toward further deterioration is predicted unless corrective action is taken. Rates of sedimentation of hydroelectric reservoirs are quantified in the Soils chapter, but the dramatic economic consequences are not effectively presented.

The small farmer is blamed for causing the major environmental problems of the country. The causes are outlined in the chapter on Small Farms and in sections of other chapters. The reason why; rapid population growth, lack of access to productive land and failure of the service infrastructure are explicitly stated or can readily be inferred.

Objectives 3 and 4: . . . to develop an analytic framework for better understanding of and taking action on environmental problems, and, to provide a detailed analysis of the constraints hindering more effective action on environmental problems.

Institutional, cultural and financial constraints hindering action on environmental problems are discussed with particularly thorough emphasis given to

the legal and institutional aspects.

Objective 5: . . . to prepare a document that will stimulate greater public and private sector debate on environmental issues.

Significant Dominican participation in the profile process coupled with excellent use of political contacts and the press stimulated considerable publicity and debate. Presentation of the Profile findings were made to the President and other high officials. Much of the Profile was reprinted serially in the newspaper. Realization of the existence of a set of related problems is a first step toward gaining public and political support for finding solutions.

Objectives 6, 7 and 8: . . . to provide an environmental assessment that will facilitate the efforts and cooperation of international development agencies in dealing with environmental problems;

. . . to make recommendations on future public and private sector actions for environmental improvement;

. . . to identify possible environmental improvement projects that could be financed by the government and/or private sector with financial assistance from international agencies.

Beyond meeting Objectives 1 and 2, the identification and compilation of environmental problems, the Profile does not explicitly provide assessment defining roles for international development agencies. However, any agency wishing to formulate a program to alleviate environmental problems will find ample information on the status of soil, water and forest resources and of the institutions responsible.

### 5.1.3 Relation of the Profile to the CDSS and ABS

The Dominican Republic Profile, published in July, 1981, opens with the following statement:

"The Dominican Republic faces very serious challenges involving food, energy and population that have already caused substantial environmental degradation and portend a bleak future not only for her natural resources but for the country as well."

Paralleling the Profile, the CDSS identifies the following problems:

". . . natural resource degradation must be reduced soon, if not arrested."

". . . the loss of benefits to siltation of major dams and irrigation infrastructure, caused by inappropriate agricultural practices, must be stopped."

Also stated is that the small farmer is the cause and the ultimate victim of the natural resource degradation problem, which closely follows the Profile.

Three projects within the food production strategy area address several of the problems explicitly. These include:

1. The Natural Resources Management Project designed to reduce extensive soil erosion in a major watershed
2. The On-Farm Water Management Project for improving the management of water at the farm level
3. The Agricultural Resources Management Project concerned with management of forest land and range land.

In the Wildlands and Wildlife chapter of the CEP, four lines are devoted to environmental education:

"1.6 Continue supporting environmental education. The government of the Dominican Republic is to be congratulated on its efforts to establish environmental education as an integral part of the national education system."

The opportunity to include a conservation component in AID's rurally oriented education program has not been seized as a complement to major agricultural support in natural resources management affecting some 100,000 rural inhabitants (ABS-1985, p. 4). Instead, a radio-based social science curriculum is being introduced (ABS - 1985, p. 6).

The relationship between natural resources and population is always a controversial issue. The Small Farmers chapter of the CEP graphically illustrates the interactions among high and increasing population density, inequitable distribution of land and services, highly variable land capability and the resultant poverty and low productivity of small farmers and rampant environmental degradation. The deterioration of the resource base, in turn, feeds back as a cause of low productivity and poverty.

AID is supporting PROFAMILIA in the establishment of an Institute for Population and Development Studies. It is responsible for "studying and clarifying complex interrelationships between demographic trends and socioeconomic problems linked to health, education, and employment, housing, agriculture, food, nutrition and energy" (CDSS - 1985, p. 60). This provides an effective framework for addressing the population/resource issue. The case for family planning built in the CDSS and ABS could be further enhanced by reference to the resource base deterioration argument.

## 5.2 Honduras

### 5.2.1 The CEP process

Honduras had suffered no recent natural disaster to galvanize national support for an Environmental Profile when the Mission agreed to fund the process.

A natural resources management project was already underway. The ROCAP regional environmental officer established contact with the two young professionals in the National Economic Planning Council (CONSUPLANE). They prepared a list of contacts prior to team arrival and served as the primary counterparts during field reconnaissance and interviews.

In contrast to the Dominican case, Mission commitment to the Profile was limited to financing and excellent day-to-day backstopping by the Office of Environment and Technology. The project did not enjoy the Mission Director or Agricultural Officer support essential to upper level interest and involvement by government leadership. In contrast the team established instant professional level rapport because three team members were veterans of recent successful Peace Corps duty in the country.

Team members each prepared reports which were typed on the AID Mission word processor. Consultants were able to edit printouts of their drafts prior to the end of their 3 to 5 week period in the country, or immediately thereafter. Once received, the team leader edited each chapter and prepared an introduction and Executive Summary. The major chapter headings were:

- Social and Cultural Issues
- Environmental Considerations in Agricultural Development
- Management of Honduran Forest Resources
- Watershed Management
- Management of Freshwater and Marine Resources
- Wildlands Utilization and Management
- Water Supply and Waste Management

Institutional evaluation was an integral part of each chapter.

The CEP draft was reviewed by the Mission and the ROCAP environmental officer but not by anyone in the host government. The publication date was August 1982.

Because of the inadequate number of copies printed and a lack of promotion the Profile was virtually unknown among Honduran professionals at the time of a site visit in September 1983. Copies from a large second printing had begun to arrive at that time. The AID supported Honduran Ecological Association (AHE) will play a major role in promoting and distributing the Profile.

#### 5.2.2 Accomplishment of stated objectives

Objectives 1: Current and potential environmental and natural resource management problems: This section will present information on environmental problems in . . . urban areas, agricultural lands, wildlands and coastal areas.

The Profile provides a comprehensive documentation of environmental issues by sector for agriculture, forestry, fisheries, wildlife and selected elements of the urban sector related to water supply, waste disposal and pollution. Specific attention is focused on coastal ecosystems. Watershed management which relates back to water supply, agriculture and forestry is treated as a separate chapter. Emphasis is placed on the development consequences of glaring discrepancies between potential land use and actual use; under-utilization, destructive practices and uses inappropriate to the tropics.

Objective 2: An assessment of the demographic, social and economic factors affecting the environment; considering population pressure, tenure, land use and development strategies.

The human dimension of environmental issues affecting development is treated in each chapter of the Profile. Addressed are productivity of agrarian reform projects, the influence of tenure of land use and deterioration, the effects of refugees and undocumented nationals on the land and social considerations in forest management. The plight of indigenous groups as a result of invasion of their lands is addressed.

Objectives 3 and 4: Administrative, institutional and legislative aspects of environmental and natural resource management including functions of governmental and nongovernmental organizations and an assessment of laws affecting the management of the environment.

An institutional and legal assessment is structured along sectoral lines including agricultural, forestry, fisheries, wildlands and wildlife, and urban water and waste management considerations. The status of educational institutions in each of the sectors is described noting the general lack of an ecological/environmental science focus. Generally lacking is an explicit analysis of the major gaps, overlaps and conflicts among institutional mandates and laws.

Objectives 5 and 6. Current and proposed environmental activities and suggestions for action.

In each chapter the programs and projects such as hydroelectric dams, reforestation and land reform are described and their interactions with the environment addressed briefly. Some forty recommendations cover virtually every environmental issue covered in the Profile. Though the two or three sentence recommendations provide some orientation, they do not provide a framework for designing concrete environmental management projects.

The sectoral chapter structure may be efficient for easy access to data on agriculture, forestry, etc., but it virtually precludes an assessment of

conflicts and interactions among sectors. For example, conflicts over Indian land claims are treated in one chapter while the agrarian reform program is treated in depth elsewhere. Foresters, park administrators and colonists often have interests in the same land. The Profile treats these issues in separate chapters.

### 5.2.3 Relation of the Profile to the CDSS and ABS

The CDSS expresses an overall awareness of the resource deterioration problem of Honduras. Under "Unfavorable Factors" related development efforts is found:

- ix. The population is increasing at the rapid rate of 3.5% per year, and the GOH has not developed an effective strategy for dealing with the problems that such growth causes or for reducing the rate of growth.
- x. Forestry and other natural resources are being utilized in wasteful ways (CDSS FY 83, p. 26).

Under current activities in agricultural/rural development:

- vii. We have initiated work in the conservation of the resource base with emphasis on improving the GOH's institutional capacity and on halting the escalating rate of deleterious use of hilly land and consequent loss of soil fertility and water holding capacity (CDSS FY 83, p. 34).

In the ABS under Health it is noted that 90% of rural Honduras lack an adequate diet (ABS 1985, p. 34).

The CDSS operative at the time of Profile preparation was dated January 1981, six months earlier. Both documents deal explicitly with the same development constraints, but out of phase and in different metaphors. In pointing out that environmental problems are in reality basic development problems (Honduras CEP p. 1 and p. 31) the Profile demonstrates the essential linkage between appropriate environmental management and sustainable development.

## 5.3 Ecuador

### 5.3.1 The CEP process

The Ecuadorean Profile is markedly different in all aspects of its execution and content when compared to the other Profiles reviewed.

The Profile was conceived in part as a vehicle for the development of the capabilities of the Fundación Natura, a private voluntary organization. In addition it provides a model of both the potential for use of a PVO to carry out a Profile as well as an indicator of what can be accomplished by a national team in a flexible time frame (Lieberman, 1982).

With the exception of a consultant review of the proposed project outline and periodic visits by an outside project advisor the process was executed by Natura and its local consultants. Natura contracted a project manager and some 14 Ecuadorean professionals to prepare the various sector reports. That people were paid to prepare their sections was the key to success. Had the job been attempted on the basis of individual's time "donated" by their institutions the quality and timeliness of the effort would probably have suffered.

In addition to introductory sections and a listing of priority actions, the Diagnostic Study on the Environmental Situation in Ecuador covered the following topics:

- General Characteristics of Ecuador
- The Population
- Anthropological and Social Aspects
- Soils
- Hydraulic Resources
- Forest Resources
- Fishery and Coastal Resources
- Energy Resources
- National Resources
- National Parks, Reserves and Wildlife
- Pollution
- Development Projects and the Environment
- Environmental Legislation
- Institutional Analysis

The study did not operate under the rigid time constraints of other Profiles. The technical writers were contracted for periods of four person/months, the institutional analyst for twelve months and the Director and staff for seven month periods. Beginning in 1980, elaboration and editing took approximately a year to complete. According to Natura the 250 copies printed of the bulky, 2 volume, 1400 page document were largely absorbed by upper level bureaucrats. An insufficient number remained for use by professionals, students and the public at large. The series of very important maps were apparently never printed. Chapters of the document have been copied individually for reference and people come to the Natura library to consult copies available there.

### 5.3.2 Accomplishment of stated objectives

Objectives 1 and 2: Develop an analytical framework of the environmental problems of Ecuador in order to better understand them and define a realistic and immediate

course of action to confront them, and, develop a compendium of the environmental problems of Ecuador, in a single document.

During the course of the Diagnostic Study it became clear that the second objective was being accomplished, the creation of a massive data base or compendium on environmental problems. In order to produce an analytic and synthesis document more useful to decision makers, AID, and Natura it was determined that a shorter document, Ecology and Development, would be prepared. (This will be discussed later.)

Natura chose to use people with a broad background in each area to prepare chapters rather than more specialized scientists in order to enhance communication to the public. Although it was noted that the scientific quality of the chapters was generally poor, this was not a major concern because the primary objective is to "raise the consciousness of the people" (Pers. Com. Roque Sevilla). Those who have evaluated the Diagnostic Study have criticized its emotional coloring, lack of documentation of data sources and failure of authors to evaluate their data quality (Hartshorn, 1980 and Lieberman, 1982). The Natura perspective has prevailed.

Objectives 3 and 4: Prepare a detailed analysis of constraints and obstacles limiting possible solutions of environmental problems in Ecuador, and, recommend practical measures, for public and private sector consideration, for improving the environmental situation.

The Diagnostic Study provides a lengthy list of obstacles and recommendations. Ecology and Development includes a more tightly focused and thorough assessment of obstacles to solving problems including entrenched land tenure patterns, rapid population growth and institutional disfunction.

### 5.3.3 Ecology and Development - Comments

Galley proofs of this profusely illustrated book being printed by Salvat Publishers in Spain were reviewed. This document is expected to:

Synthesize the information in the Diagnostic Study and to consolidate its conclusions and recommendations into more concrete proposals for national conservation. It is also intended to be a teaching document for managers concerned with natural resources and environment and a statement of Fundacion Natura's reaction to the Diagnostic Study (Lieberman, 1982).

This book is almost exactly the same length as other Profiles prepared in the Dominican Republic, Panama and Honduras. The striking contrast in focus and content compared with other Profiles illustrates the difference between the

Natura, and the typical North America, approach to identifying and solving the same environmental problems.

The Natura book is philosophical, emotional, global in perspective and with few maps, statistical tables or references. The other AID profiles are dispassionate, edited down to concentrate the most data in the fewest pages. Neither is better than the other. Each seeks to raise consciousness and evoke action, one by emotional appeal and the other by the weight of data. Each approach is consistent with the modus operandi and cultural reference of the author institution. Both approaches are explicitly oriented toward environmental conservation problems. Significant success in solving the major problems affecting environmental quality, such as deforestation and erosion, would at the same time contribute to sustained human development. It is doubtful, however, that the Natura or the other Profile approach alone will effectively convey that message to development decision makers.

If AID in Ecuador is to have a Country Environmental Profile which accomplishes the objectives set out for other Profiles and which will contribute to its internal Project Planning Process--the Mission will have to prepare its own document drawing heavily on the two Natura studies.

#### 6.0 Utilization of Profiles

More effective utilization of Profiles by AID, host countries and other donors alike would be enhanced by the following:

- Timely execution relative to strategic planning cycles and elections, expeditious bilingual publication and the printing of sufficient numbers of copies to permit promotion and use.
- Preparation of a more "user friendly" document which goes beyond data compilation and problem identification to include a synthesis addressing both underlying causes and solution strategies. Such synthesis would provide convincing support for assistance in population planning, land tenure reform and agricultural technology appropriate to small farms in the tropics--the dominant problems underlying hunger, poverty, political unrest and environmental deterioration.

#### 6.1 Use of Profiles by AID Missions

Background and justification were the most commonly heard terms used by AID officials to describe the value of the Profile. New employees and consultants use the Profiles to gain an overview of the country, its resources and major natural resource related problems. A concrete example was the Presidential Commission forest sector team in Honduras. The Profile provided

a concise overview of problems limiting productivity of the forest sector (Pers. Comm. Clarence Boonstra). Similarly, Profiles in Central America were used as briefing documents for the Kissinger Commission (Pers. Com. Albert Printz).

In Honduras the Mission leadership did not substantively participate in the Profile process. However, Profile availability and the interest of a new Agricultural Officer created the opportunities mentioned below. In Honduras the Profile provided substantial justification for a Vermont Partners and a Rotary International project, both related to small scale agriculture and soil conservation on hill land. The Profile has provided substantive background for a Bay Islands conservation project now at the Concept Paper stage. According to Mission professionals the justification role of the Profile applies within the Mission, in promoting a project in Washington and with government agencies (Pers. Com., Ray Baum, AID).

In the Dominican Republic the Mission Director and Agricultural Officer played a dynamic role in organizing government participation prior to consultant team arrival, allocating staff time to work with the consultants and later to promote the product. Such involvement heightens knowledge of Profile content and the potential for utilization. As mentioned earlier the Profile played a substantial role in justifying support for natural resource management and forestry projects.

In Ecuador direct AID involvement in the Profile process was limited due to the arm's length approach to institution building with the Fundación Natura. The profiling process generated substantial material used in an AID funded project in environmental education. Natura published 250 copies of a 1400 page diagnostic study carried out by local experts. This voluminous document in Spanish has been little used by AID. The final product of the profiling process will be a book, also in Spanish, that analyzes the diagnostic study and makes recommendations. Some 5000 copies will be printed and given wide circulation.

In Zaire, the Agricultural Officer reported that the Profile was competently prepared and that its primary use has been as a briefing document. There the overwhelming focus of the Mission is on food production while the Profile only devotes one page to agriculture. Strong interest was expressed in a Profile incorporating land capability assessment (Pers. Com. Richard Peters).

Profiles have been promoted by AID Washington and carried out by the Missions on a purely ad hoc basis. The purpose has been to increase environmental awareness. Linking the Profile (both initial and update) to the preparation of the Country Development Strategy Statement would give appropriate formal focus to the process. The CDSS review could then include an evaluation of the adequacy of both the Profile itself and its integration in the Development Strategy.

#### 6.2 Use of Profiles by host countries

Unfortunately, opportunities for utilization have been limited due to factors which vary from country to country. Bolivia conducted the first Profile in late 1979 and two coups occurred during the publication period, breaking linkages between AID and government personnel. In addition, the document was published only in English, severely limiting utilization. In Panama three years passed between field work and the publication of a Spanish edition in May 1983. The English version has yet to appear. Personnel changes in AID and editorial difficulties are contributing factors. In Honduras it took two years before a sufficient number of Spanish editions were available for effective distribution (September, 1983). In the Dominican Republic the supply of copies, though larger than elsewhere, came nowhere near meeting the demand created by a very effective promotional effort.

In Honduras the President has formed a national committee for the conservation and improvement of the environment involving both the public and private sectors--1983 was designated Year of Forest Protection and Environmental Improvement. The Mission Director indicated that the Profile coupled with other AID initiatives were a decisive factor behind these Presidential actions (Negroponte Cable, June 1983). The increasingly active Honduran Ecological Association (AHE) is using a workshop built around the Spanish edition of the Profile to promote awareness and action on environmental issues affecting development.

Familiarity with a Profile has been greatest in the Dominican Republic, in part because it has been available in Spanish for the longest period. An official in SURENA (the Natural Resources Subsecretariat of the Ministry of Agriculture) said that the Profile is their "bible" on resource issues. Staff from this agency were the principal counterparts to the consultants. Active participation in the profiling process made these people equally active partisans for AID projects in natural resource management and forestry.

The Profile contributed significantly to awareness of environmental problems, particularly when sections of the document were published serially in the newspaper and the "environment" became a political issue in the 1982 presidential election campaign.

In Ecuador a Profile in a form comparable to those developed elsewhere with AID funding has yet to be published. The 250 copies of the diagnostic study have largely disappeared into the libraries of upper level administrators. The sheer bulk of the document has left a strong impression as to its importance according to the President of Fundación Natura. Publications, educational programs and press releases based largely on Profile data have increased public awareness of environmental issues at all levels.

### 6.3 Use of Profiles in institution building

Assisting developing countries "in building the institutional and scientific capacity required for identifying, assessing and solving their critical environmental and natural resource problems" [and opportunities] is a stated AID policy goal (PD 6, 1983 p. 1). Profiles in Bolivia, Panama, Honduras, Upper Volta and Zaire were conducted with outside consulting teams drawing on local professionals for data. In Turkey a local PVO prepared a Profile with no involvement by AID. In the Dominican Republic the international consultants worked through a division of the Ministry of Agricultural but did the report preparation themselves. In Belice and Costa Rica local consulting firms with U.S. origin staffs coordinated national and international input. Costa Ricans drafted most of the CEP chapters. Ecuador constitutes a distinct case in which the Profile was used as a mechanism for expanding the capabilities and influence of a private conservation group. The determination of the PVO to conduct the Profile without offered technical assistance has resulted in a final document which does not meet all of AID's internal CEP goals, but which will be quite influential nationally.

It can be concluded that with the exception of Ecuador, no Mission has considered institution building to be a primary or collateral function of the Profile process. Robert Goodland of World Bank points out that there are some 114 Ministries of Environment in the world under a variety of names (Pers. Com. Robert Goodland, 1983). In addition there exist probably as many struggling PVOs with a conservation/environment orientation. AID would be well served to use both the Profile and Environmental Assessment processes

for institution building. Involved would be greater Mission responsibility and involvement but not greater cost. Based upon slender empirical evidence from Profiles to date, it appears that a team effort by the Mission, host country and complementing consultants can be most effective given the tremendous value derived from participation where it has occurred. Neither a hands-off local effort nor an outside consultant strike force can yield the benefits that would be anticipated from a team approach (See Section 3.0).

#### 7.0 Place of Profiles in AID Environmental Policy

To the agriculturist, the environment is a farm; terraced, irrigated and drained to produce food and fiber; the forester would organize the forest environment to maximize sustained production of timber, pulp and fuel. The environmentalist's environment is a pristine landscape of ecologically diverse rainforests, coral reefs and mangroves populated by rare and endangered species. The coastal developer sees an environment of juxtaposed fishing fleets, aquaculture ponds, luxury hotels and busy ports.

Each of these landscapes is AN environment jealously defended and promoted by a particular sector. It is intuitively clear that the total domination by any one sector would be disastrous for sustained development. AID, the rest of the development assistance community and all countries can ill afford to capriciously favor one sector over others. Rather, they must seek a viable management strategy for THE environment--with its essential natural, agricultural and urban-industrial components which together support sustained development for peasant farmers, indigenous cultures and urban dwellers.

Humanity owes a great debt to the environmental groups worldwide, and AID particularly to those in the U.S., for their educational and legal actions forcing recognition of natural ecosystem values and the interconnectedness of all components of THE environment. It is now time in AID to move beyond recognition to acceptance and effective integration. Unfortunately, some AID officers in the field still perceive Environmental Assessments and Profiles in a negative, adversarial light; as expensive chores peripheral or even threatening to the solving of pressing development problems. The application of AID environmental policy tends to perpetuate dichotomies and isolation.

Assessment procedures defined in 22CFR Part 216 focus on avoidance and mitigation of negative impacts on the environment (implicitly the natural environment). The Initial Environmental Evaluation in effect precludes the

significant positive contribution that a timely and systematic application of environmental science expertise could make in agriculture, forestry, fisheries and watershed and wildlands management. Unwittingly a recent Policy Determination tends to perpetuate the negative caste of environmental concern.

"Eliminated from AID's requirement of environmental review are categories of projects with little or no likelihood of [negative] environmental impact. Conversely, projects which are most likely to result in significant adverse impact and which will always need further detailed environmental study are identified." (PD 6, 1983, p. 2)

Profile goals carry the same message--identify and compile information on environmental problems with deforestation, erosion, sedimentation and pollution being the dominant themes.

This negative image and sense of peripheralness plaguing Assessments and Profiles can be changed as Regional and Mission Environmental Officers, technically and morally reinforced from AID Washington:

- Accentuate the positive contribution to development of such environmental scientists' activities as land capability assessment and application of ecological expertise to agriculture, forest management and in design of low cost wastewater treatment.
- Become holistic "brokers" among the several sectoral interests in AID and in the host country pointing out potential conflicts and opportunities at the strategic development planning level.
- Closely integrate environmental consultants with Mission staff in the timely application of expertise and reports in the Development Project Planning process.

AID's operational philosophy and strategy should avoid both the environment VERSUS development and environment AND development cliches; THE environment is not a sector but rather the whole interacting system that supports life. Development is an intersectoral and interdisciplinary process of managing the environment to increase and sustain human well-being. AID should modify its limiting policies and embark upon the arduous process of demonstration and education. Nowhere is the opportunity to demonstrate the positive, holistic approach more apparent than through Environmental Profiles timed to provide complementary input to the Country Development Strategy and Project-Identification processes.

AID will find among the environmental and conservation groups both prickly allies and implacable adversaries, depending on the issue. Most groups now espouse a broader perspective expanding upon a basic concern for wildlands and wildlife to include such elements as soil and water conservation. This

perspective is exemplified by the World, and more recent, National Conservation Strategy effort of the International Union for the Conservation of Nature and Natural Resources ("Natural Resources" was added to the name recently). These groups have realized that without improvement in human well-being including conservation of soils and stabilization of population, there can be no hope of conserving nature. Hence, they have made a somewhat uneasy compromise with their origins and traditional constituency to support sustainable development (see Appendix 2). This holistic perspective is as new to them as it is to AID. These groups will continue to defend nature as a sector out of loyalty to their constituency and because the values of ecosystem services and species have yet to be adequately documented or quantified. The aesthetic and scientific values which groups so ardently defend can be expected to become the concerns of other segments of the world population when and if basic survival needs are met. The Natural Resources Defense Council (NRDC) has given top priority to completion of Profiles in all countries served by AID (NRDC, 1980). NRDC testifying in behalf also of the Sierra Club, World Wildlife Fund (US), and the National Wildlife Federation again urged completion of Phase II Profiles in 1983 (NRDC, 1983).

## 8.0 Recommended Environmental Profiling Process

### 8.1 Introduction to the process

The value of the product, a bilingual Country Environmental Profile, is derived in large measure from the process of elaboration and promotion. Essential to effective utilization of the document is the broadest possible participation by host country professionals, AID staff and other cooperating donors if appropriate complemented by consultants. The steps in the process include:

- Pre-planning - consensus on goals and approach
- Profile workshop - establish a functioning team with a common methodology
- Assessment - benchmark data base collection, compilation
- Promotion - effective communication to influence policy and action
- Follow-up - facilitating measures of change and feedback to development

### 8.2 Pre-planning

Once the AID Mission has decided to prepare a Profile and preliminary contacts made with potential collaborating agencies and private groups, an experienced project advisor should be selected. This advisor will follow

the entire project through the promotional phase and will report to the AID Mission Director. Objectives of a ten-day pre-planning visit will be:

1. To determine in consultation with the Mission Director and Staff, (a) the purpose and expected results of the Profile, particularly in relation to the development project planning process, (b) technical expertise and time commitment of staff and (c) to define a strategy of coordination with national entities, particularly with the counterpart organization.
2. Establish liaison with a counterpart organization, governmental or private. This organization should have prestige and access to all sectors, either through the institution or through the reputation of the individual designated as the host country Profile team leader.
3. Prepare with an ad hoc team of national and AID experts conceptual definition of the sectors which make up the economy, known or potential conflicts among sectors and general location of major development projects.
4. Define overall Profile goals with reference to national development goals, such as a five-year plan.
5. Identify expertise requirements, including those areas requiring outside reinforcement. Prepare a scope of work and individual terms of reference. Establish clearly the responsibilities and financial accounting procedures which will govern all the participants in the Profiling process. Local consultants should be paid to enhance accountability.
6. The Mission, in coordination with the advisor and AID/Washington, will contract outside consultants in those areas needing outside expertise.

### 8.3 Profile workshop

The duration of this workshop for host country experts, Mission staff and consultants should be two weeks with three days devoted to a field trip at the beginning of the second week. The three major functions of this workshop are (a) to establish effective group dynamics among the participants from different institutions and cultural backgrounds, (b) establish a structure and methodology for the team to follow in conducting the Profile including general layout, maps and other graphics, source citations and length, and (c) define in detail the priorities, objectives, work strategy and logistical/material requirements. After the workshop the advisor will review the overall work plan based on the workshop with the team leader and together they will prepare a Critical Path chart based on the work plans submitted by each team member. The results of the CPM exercise will be discussed with individual

team members and adjustments made as required.

Major elements of the workshop include:

1. Profile inauguration--short addresses by the Mission Director, Minister of Planning (or of similar responsibility) and the director of the institution responsible for the Profile, introduction of the team and a response from the team leader. Among invitees would be the international donor community, environmental groups and representatives of the private sector.
2. A formal group dynamics session if an appropriate professional team is available.
3. Introduction to environmental management, systems analysis and CPM.
4. Analysis of the country and its major regions as a system.
5. Briefings by major sector representatives to discuss development issues and conflicts unique to that sector--including energy, forestry, agriculture, agrarian reform, fisheries, mining, health, minority affairs, education and research, population, parks and wildlife and tourism. Those who provide briefings will then become contacts for diffusion of Profile results.
6. Identification of major conflicts and management opportunities.
7. Definition of objectives and establishment of methodologies.
8. Field trip as a team to a watershed where complex development issues can be demonstrated.
9. Discussion of sectoral information gathering strategies in a regional and national system context.
10. Determination of critical milestones for each team member in the CPM framework.

#### 8.4 Team Formation

Composition of the team will be dictated by the nature of the region and the mandate. Among the disciplines likely to be needed in a regional scale project are the following:

Discipline	Function
Engineering - civil, hydraulic, sanitary	Design roads, dams and treatment. Provide performance parameters for alternative strategies. Cost and technical feasibility of alternatives.

Discipline	Function
Physical sciences - geomorphology, geology, hydrology	Land capability, erosion, mass movement and tectonic hazards, water management strategies.
Biological sciences - Botany, zoology, limnology, ecology, epidemiology	Natural system structure, function and inventory. Habitat delimitation. Park and refuge design. Eutrophication prediction. Pest and disease vector studies.
Applied sciences - Agronomy, animal husbandry, soils, forestry, wildlife ecology, fisheries biology	Land capability assessment. Design of food, fiber, wood product and recreational projects in coordination with appropriate biological scientists.
Social sciences - Anthropology, sociology, psychology	Cultural perceptions, aptitudes, needs and constraints relative to projects. Cross cultural communication. Extension. Public involvement.
Integrative sciences - Systems ecology, geography, economics, regional planning	Integration of sectoral projects for regional development. Ecological, energetic and economic feasibility.

A core team of experienced individuals representing the technical, ecological, social and economic aspects of regional development can be complemented by specialists as problems are identified. Often a core team member has the breadth to cover several disciplines at the initial state of analysis. A goal of the development authority should be to have the core team as part of its permanent staff, with specialists available on loan from other agencies or from the international consulting community.

In a profiling exercise integrating environmental management considerations, the engineer, economist, and ecologist still perform their disciplinary and sectoral functions. What is added is an interdisciplinary structure and a methodology for communication, evaluating recommendations and for making adjustments in the Profile. All team members should be environmentalists in the sense that regardless of specialty, each understands that important interactions and interrelationships occur outside the traditional area of any particular discipline or sector. In this context, the function of the ecologist and other environmental scientists is to quantify and evaluate these interactions and interrelationships and make management recommendations to the profiling team.

### 8.5 Assessment

Once the team members have established a common set of procedures, methodology, and understanding of the interactions among sectors, then

sectoral research can proceed. Periodic progress meetings, provide the opportunity for information exchange and synthesis.

#### 8.6 User guidance

An explanatory cover memo will be prepared to assist those in each target group; decision makers, agency professionals, AID officials, teachers, conservationists, etc.; find and interpret data and analyses in their own context. The Profile methodology will be described in sufficient detail for adaptation by those wanting to evaluate other issues.

#### 8.7 Promotion

Without effective promotion the Profile will become just another information-packed and useful document that is added to the myriad of others gathering dust on the bureaucrat's bookshelf. Each potential user will require a somewhat different approach. For the President and cabinet perhaps a one-hour presentation with flip charts and the distribution of an Executive Summary would be appropriate. On the other hand more detailed workshops and panel discussions would be suitable for professional and university groups. For the public, press releases, TV spots, audiovisuals and pamphlets could be effective in different settings. If in fact the Profile results are relevant to human well-being and development, then a concerted effort to communicate with, and gain the support of, peasant and indigenous groups and farming and ranching associations will be in order. Creation of an elite patron group drawing from the leadership of engineering societies, service clubs, industry and conservation organizations would aid in the diffusion acceptance and use of the Profile. AID should be acknowledged for its contribution of funds and personnel, but major credit should go to the national institution, team leader and consultants.

#### 8.8 Follow up

The first Environmental Profile is a beginning, a benchmark against which to measure progress and failures in maintaining the quality of the human environment. What data is gathered and how it is recorded should lend itself to updating and measurement of change. This includes quantitatively verifiable environmental parameters such as land cover and use, as well as more complex measures of development accomplishment compared with goals. Techniques will have to be devised to combat the institutional amnesia that plagues developing countries (and AID Missions). At least if the Profile can cite, for example, a FAO timber growth plot report, note who has one of the three copies in the country and locate the now abandoned

plot on a map--so that invaluable long-term measures can be made ten years hence. The follow-up process will be described in the Product section.

#### 8.9 Profile process report

Useful to the continuing refinement of the Profiles as a tool would be a report from the Mission covering the following points:

1. Contribution of the Profile to the Development Project Planning Process with particular emphasis on the CDSS.
2. Contribution of the Profile process to institutional development and national commitment to sustainable development. Provide specific examples and comparisons with conditions at the time of a previous Profile (in the case of Profile updates).
3. Qualitative and quantitative changes in the state of the national environment as revealed by the Profile and subsequent update. Cite a few illustrative examples.
4. Contribution of project Environmental Assessments and Sector Assessments to updating of the Profile data base.

#### 9.0 Elements of a Country Environmental Profile

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- I. Purpose of the Profile (2 pp.)
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  - C. International programs
- IV. The National Environment (50 pp.)
  - A. External interactions
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  - C. Population
  - D. Interaction matrix
  - E. Background data
  - F. Institutional analysis
    1. Governmental institutions
    2. Education
    3. Consulting firms and PVO's

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  - B. Steps in Modelling
  - C. Life Zones
  - D. Conflict resolution and management opportunities
- VI. The Updating Process (6 pp.)
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  - F. Bilingual glossary

I. Purpose of the Profile (2 pp.)

This section outlines how the Profile serves the process of sustained, optimum development. Elements that should be mentioned are:

1. A benchmark for measuring the status and changes in the capability of the environment to supply goods and services.
2. Description of the country as a system of interacting and interdependent sectors.
3. A sectoral data base including the traditional economic sectors, the people, education and research, consultants and Private Voluntary Organizations.
4. Regional management areas--a series of case studies of priority areas focused on development conflicts and opportunities at the provincial or river basin level.

II. Cultural history of human interactions with their environment (3 pp.)

The present status of the environment and the development level it supports should be described as it has evolved since the beginnings of agriculture. Emphasis is on those technological and social changes that have most dramatically affected environmental management.

III. Development goals (4 pp.)

- A. Description of the current, and recent past, five year or similar development plans and an assessment of their sensitivity to environmental management considerations including constraints and

opportunities, available technology and carrying capacity.

- B. Description of AID's Country Development Strategy and current project portfolio in the context of national development planning.
- C. Programs, project portfolios and policies of the international development assistance community.

#### IV The national environment (50 pp.)

This section provides first an accounting of the country's interchanges with the rest of the world, second, an outline of sector or component structure and function with emphasis on management, both to optimize productivity and minimize impacts on other sectors and third, a perspective on interactions among major sectors.

##### A. External interactions

The block diagram illustrates the major inputs and outputs of the country (see Figure 2). This accounting of energy, material and capital interchange with the rest of the world will provide valuable insights into the management of the national environment. Elements of interest could be degree of dependency on outside sources of food and energy. For example, the Dominican Republic Profile noted that the value of fish exported was 3% of cost of fish imported. This indicates for an island nation an incongruous foreign exchange drain worthy of assessment. Data indicating major exports of plantation crops or meat can be an indicator of possible land use conflicts. If the air, rivers, ocean currents or migrants carry harmful materials or disease across national boundaries, internationally significant impacts may occur.

##### B. Sectoral overview

Nationally aggregated data on each major sector of concern in development will serve as a benchmark for comparison with future updates. Data gaps will be identified for future action. Figure 3 illustrates two typical sectors, mining and fishing. Extraction of a non-renewable resource involves heavy demands on surrounding sectors or components-- forests, agriculture, waters, etc. for new land and water and for the receipt of wastes. In contrast, fishing involves extraction of a resource at some renewable rate with few secondary effects. The fish habitat is vulnerable to a wide variety of potentially damaging effects from other sectors upstream. The outputs of one sector become the

inputs of another. When an input has a negative effect then an inter-sectoral conflict has been identified.

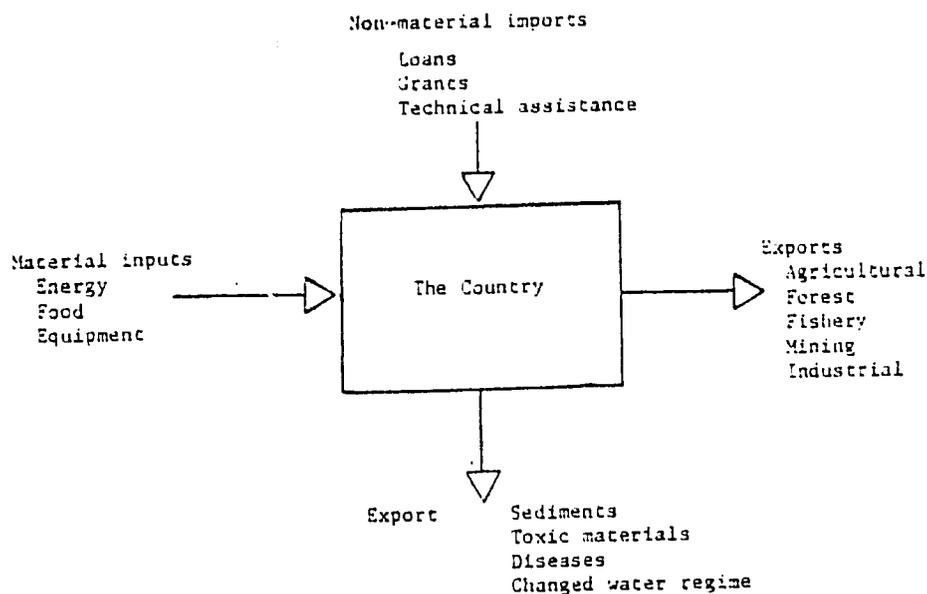


Figure 2. External interactions.

### C. Population

This section should review those basic characteristics of the population which affect environmental management and development and which reflect quality of life.

Aspects to consider include:

1. Ethnic composition - dominant and minority groups, differences in use and perception of the environment
2. Land and resource access - access to land, appropriate technology, credit for inputs and water.
3. Diet - adequacy, security and diversity
4. Demographic data, - population growth rate, mortality, life expectancy, density, rural/urban comparisons.

5. Economic indicators - employment by sector, unemployment, income by sector, migration, urban/rural comparisons.
6. Health - incidence of environmentally related diseases.

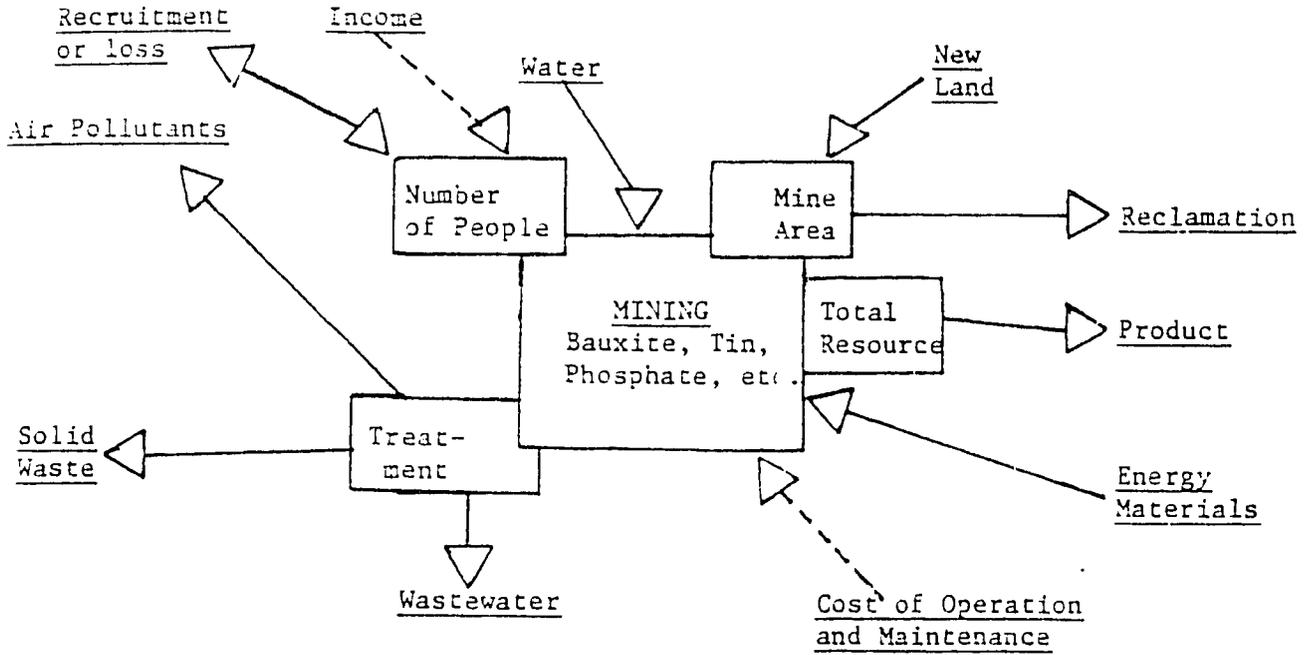
D. Interaction of matrix

An interaction matrix plotting sectoral activities on both axes can permit the rapid identification of potential conflictive and complementary interactions between sectors. (Figure 4) Such a matrix can be useful in preliminary familiarization with issues but should not be used as an analysis tool because of the prevalence of chain and delayed effects and feedbacks which cannot be represented conveniently in a matrix.

The following is a discussion of the numbered interactions in Figure 4 illustrating the types of conflictive and complementary interactions among sectors on a national or regional scale.

1. Shifting agriculture/cattle production-In the Western Hemisphere tropics, shifting agriculture is often followed by conversion of the land to permanent pasture rather than back to forest fallow. This process leaves the farmers in a marginal position as ranchers consolidate land holdings, forcing them to seek new forest lands to clear.
2. Shifting agriculture/Forest production-Farmers lack access to timber markets and often burn valuable timber when clearing land. After logging, access roads are used by shifting agriculturists and/or ranchers to occupy new land. Reforestation by succession or replanting often is not feasible.
- 3., 4. and 5. Shifting agriculture with: Watershed management/Parks and Wildlife/Hydroelectric energy-Shifting agriculture at low intensity, with long fallow periods, as practiced by a few indigenous groups is compatible with the other uses. The more common intensification caused by population growth coupled with the aforementioned conversion of land to pasture has a decidedly negative effect on the other uses.
- 6., 7. and 8. Cattle production with: Forest production/Watershed management/Parks and wildlife-Pasture displaces sustained forest production, usually on sites suited only for forestry. Predominantly poor range management characterized by overgrazing and

(a)



(b)

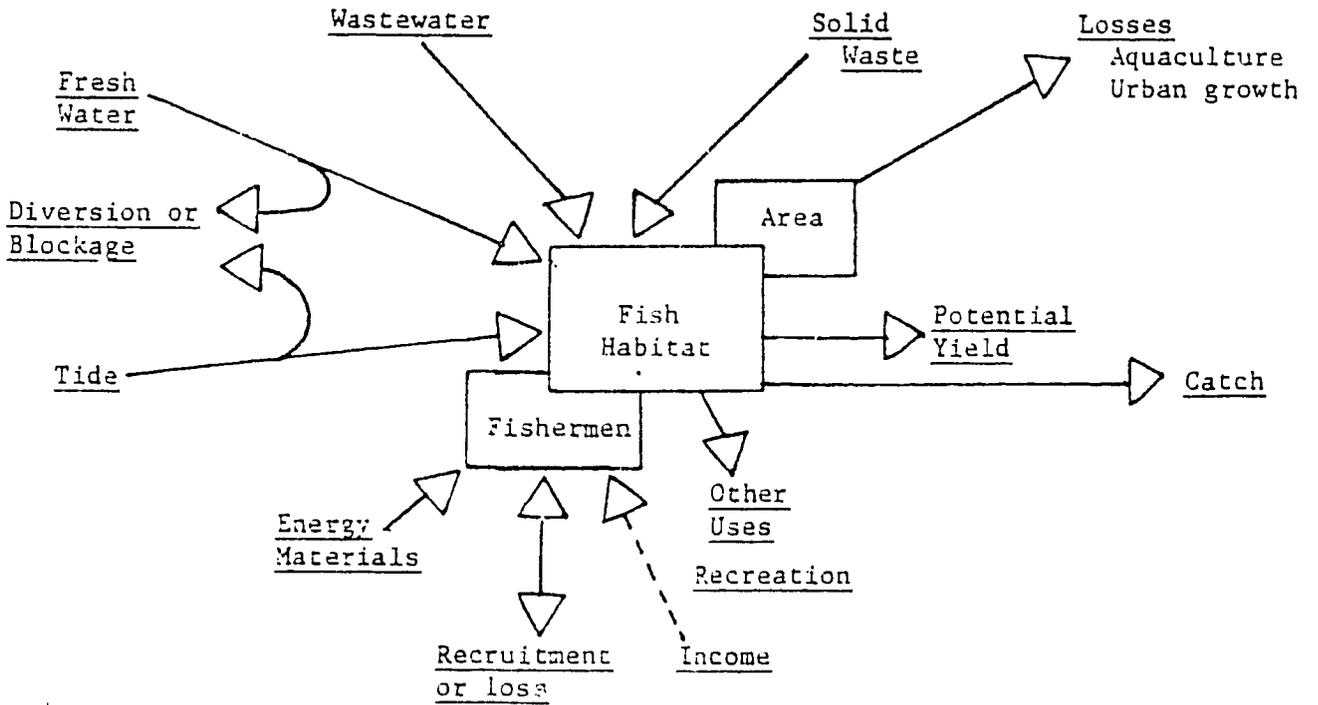


Figure 3. (a) Mining sector input-output. (b) Estuarine fishing sector input-output.

Figure 4. Partial matrix of Intersectoral Interactions.

	Shifting agriculture	Cattle production	Forest production	Watershed management	Parks and wildlife	Hydroelectric energy
Shifting agriculture		1	2	3	4	5
Cattle production			6	7	8	
Forest production				9	10	11
Watershed management					13	14
Parks and wildlife						15
Hydroelectric energy						

uncontrolled burning results in degradation of watershed values. Conversion of forest to pasture results in major losses in wildlife and recreation values.

9. Forest production/Forest production-Many systems of sustained yield tropical forest production have been under investigation. The potential for applying the most promising results should be evaluated, such as strip clear cutting, selective cutting, enrichment of succession (taunyga) etc.
10. and 11. Forest production with: Watershed management; Parks and wildlife-Erosion resulting from access roads plus spontaneous colonization following access roads is the most common incompatibility between forestry and watershed management. Forestry is incompatible with the values derived from complete protection of park areas. Wildlife values are less affected by succession management than by plantation monocultures.
12. and 13. Watershed management with: Parks and wildlife/Hydroelectric energy-Hydroelectric energy production and all other downstream water uses benefit from the least disturbance of upper watershed areas. Therefore, the complete protection usually desirable for

parks and wildlife is also a beneficial form of watershed management.

14. Parks and wildlife/Hydroelectric energy production-Reservoir inundation, changes in downstream water regime and access roads are all generally detrimental to the integrity of parks and to wildlife values.

E. Background data

To support a country description thematic maps, surveys and reports should be collected to help identify the sectors, resources, spatial patterns and interactions unique to a particular country.

F. Institutional analysis

1. Governmental institutions

Factors to consider include:

Mission - Legal mandate of the institution

Budget - Personnel, Operations and maintenance, Research, Infrastructure, Training, Materials

<u>Personnel</u>	<u>Central Office</u>	<u>Field</u>	
Professional	x	x	
Technical	x	x	
Other	x	x	
<u>Equipment</u>	<u>Items</u>	<u>Items</u>	<u>% Operable</u>
Laboratory	x	x	x
Computation	x	x	x
Vehicles	x	x	x

Programs - Description, Budget, Duration, Results

International Assistance - Description, Grant/Loan, Duration, Results

Training - Inservice, Short Courses, Degree training, Budget

Intangibles - Turnover rate, morale, productivity, reputation

The institutional analysis should not be restricted to the "natural resource" agencies concerned with soil conservation, parks and wildlife. These institutions generally have the least power to control and guide environmental management. The degree to which ecological concepts and experience are applied in agricultural development projects is of high priority concern for example.

2. Education

The education and research sector includes environmental science

education and research at universities and institutes, formal environmental education at all pre-university levels, in-service training for professionals and non-formal public education.

The personnel, budget and program evaluation should be similar to that used for government institutions. Particular attention should be given to the training level of personnel, productivity, extent of communication with other professionals and overall morale and spirit of enquiry. An assessment should be made of the quality and accessibility of library materials. Are the professionals actively pursuing and promoting solutions to environmental management problems as a key to sustained development?

### 3. Consulting firms and PVOs

The evaluation of consulting firms and Private Voluntary Organizations should include, in addition to those oriented toward conservation or ecology, those powerful groups whose members' activities affect the environment such as engineering societies, industrial associations, agricultural associations and civic clubs.

## V. The Regional Perspective (60 pp.)

### A. Introduction

Most development projects appear to be highly focused when viewed at the river basin or provincial scale. This generalization applies to dams, mines, and roads as well as agricultural, silvicultural and aquacultural projects. The sectors promoting such projects have hopes for demonstration effects, e.g. new farmers adopting technology, and wide-spread secondary development benefits. Less often do sectoral planners perceive either the effects of their activities on the productivity of other sectors or alternative strategies for achieving the goals of their own sector. Two common examples of such sectoral myopia are:

- Dam building that fails to take into account the havoc wreaked upon downstream fisheries due to river flow regulation or diversion.
- The sanitary engineer who perceives a wastewater treatment plant as the only means of secondary waste treatment when ecologists, agronomists and Chinese aquaculturists could offer a variety of alternatives.

A defense against costly suboptimum development resulting from the two types of myopia described above is the interdisciplinary analysis of a region as a dynamic system. A generalized process of carrying out a

Profile at the regional scale is schematicized in Figure 5. Formulation potential development issues is best accomplished in a brainstorming session involving country institutional personnel, Mission staff and several consultants with broad experience relevant to the problem. Potential issues and interactions are derived through a combination of intuition, knowledge of the area, and extrapolation from experience elsewhere.

To better understand the interactions among various development activities and the regional system a conceptual model is useful. A conceptual model is a simplification of reality to facilitate analysis. Such a model may be a written description, a checklist, a matrix or a diagram which represents relevant processes and interactions. Generally a combination of techniques are adopted to the complexity of the problem and the experience of the team. The diagramming process is outlined below.

#### B. Steps in modelling

- Step 1. Identification of system limits. If a dam for generation of electricity or the supply of water is an issue then the watershed is the logical regional limit to encompass the source of water and sediment and the potential downstream effects. Often regional limits are politically given. Interactions within the region then become distinguished from exchange with other systems.
- Step 2. Definition of scale. Most important is that recommendations be accurate and at a level of precision (scale) permitting useful planning recommendations to be made. Scale or scales represent a compromise among considerations of budgets, quality of the data base and the nature of the problem.
- Step 3. Identification of components. In any region the major divisions are natural systems (terrestrial and aquatic), managed systems (agriculture, silviculture or aquaculture) and the urban-industrial component including such infrastructure as dams, roads and factories. Within each component are the familiar sectors such as forestry, agriculture, fisheries, tourism, etc. Associated are the people who benefit from activities being evaluated and those who are affected adversely.

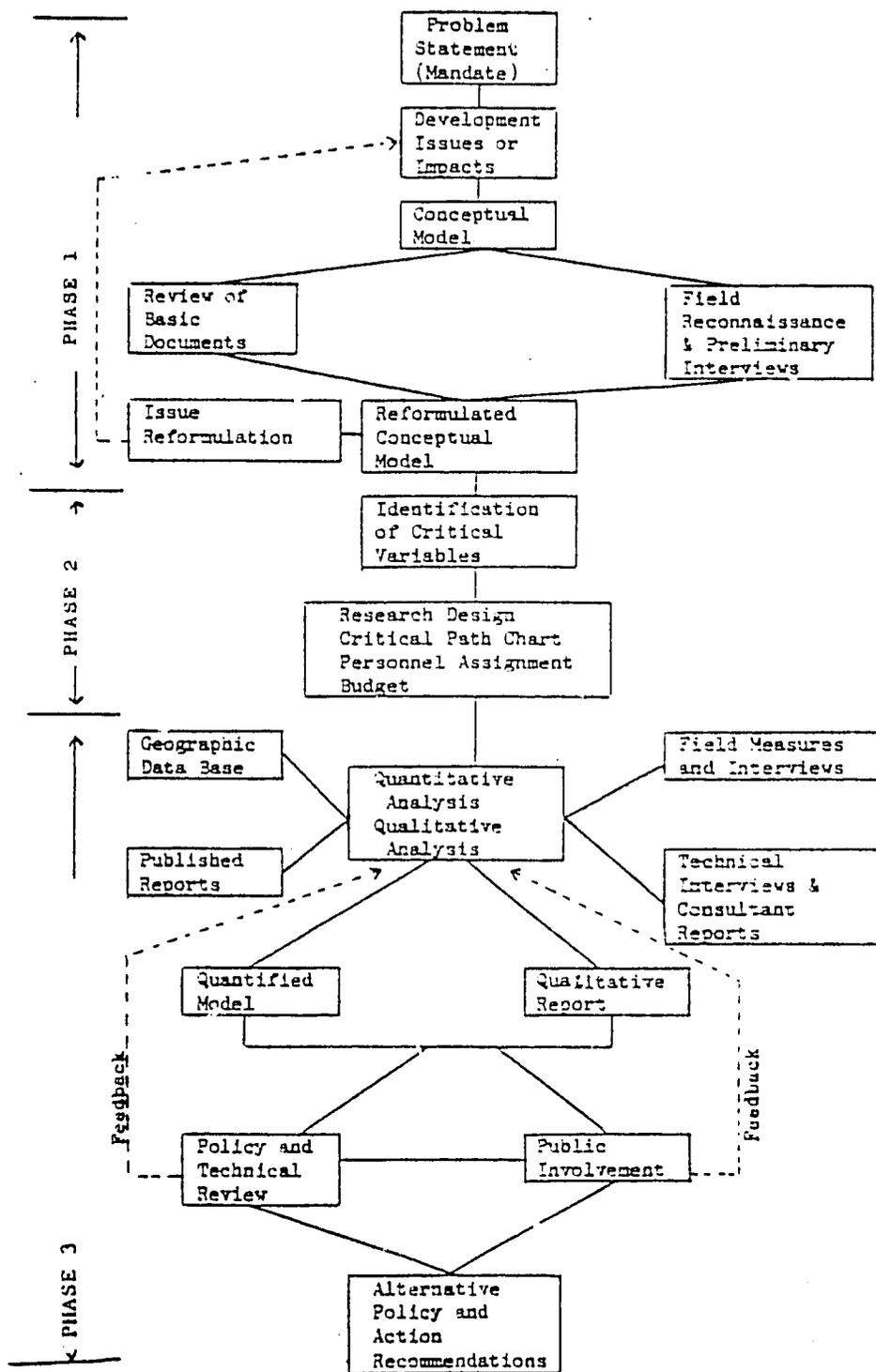


Figure 5. Development and assessment process

- Step 4. Identification of inputs and outputs. Once system limits are established (Step 1) exchanges across the boundary can be identified including energy, materials, information and people.
- Step 5. Interactions. Inputs interacting with internal feedbacks and exchanges among components (sectors) result in the dynamic functioning of the system and the system outputs.
- Step 6. Preparing the diagram. A block diagram is compared including the components or sectors in a form similar to Figure 3. Lines are drawn and labeled to represent inputs, outputs, feedbacks and interactions. The finished product represents the region as a dynamic system and can help the team identify important interactions among sectors, including both conflicts and support functions.

A checklist for model preparation is shown in Table 2.

Some of the values of the modelling process include:

1. It enables the team members to "know" the functioning of a region systematically, rapidly and quite thoroughly;
2. It enables the many disciplines and sectors represented on a Profile team to understand where their work will fit in the overall scheme;
3. It allows a tightly knit yet flexible work plan to be written;
4. It enables team members to identify gaps in information and to figure out which areas of study are potentially the most fruitful;
5. It enables the team leaders to write highly specific terms of reference for the work of the different disciplines and sectors. Consultants can no longer use a scatter gun approach; neither can they get by with dusting off old reports and plugging in new place names.
6. It provides a hook on which to hang ideas and enables team members to foresee the ramification of each activity; and
7. To reiterate, it enables team members to identify interactions so that potential conflicts can be resolved early on and so that opportunities for inter-sectoral support can be seized.

Case studies of high priority development activities within this regional context will permit the testing of the more generic observations made at the national scale (Section IV).

### C. Life Zones

A major contribution to the understanding of a region and its management

Table 2. Checklist for a regional model

SYSTEM ELEMENT	CHARACTERISTICS
System inputs	<ol style="list-style-type: none"> <li>1. Technology, information and policy</li> <li>2. Equipment, materials and all supplies</li> <li>3. Services</li> <li>4. Energy quantity and quality - fossil fuels, electrical, solar, wind, etc.</li> <li>5. Water - rain and inflow from other systems</li> <li>6. Sediments, organic matter, chemicals, etc. from upstream systems</li> <li>7. Money - when an input involves an economic transaction</li> <li>8. Immigrants</li> </ol>
Components	<ol style="list-style-type: none"> <li>1. Developed subsystems <ul style="list-style-type: none"> <li>Industry - extractive, processing, power transformation, etc.</li> <li>Infrastructure - transportation, dams, structures, etc.</li> <li>People - demographic characteristics, cultural perceptions and interactions with the environment</li> <li>Cities - structure and function, interactions with hinterland, intercity interactions</li> <li>Institutions - structure and function, role in relation to all subsystems, actual capabilities</li> </ul> </li> <li>2. Managed subsystems <ul style="list-style-type: none"> <li>Farms and ranches, silviculture, aquaculture-structure and function, area, location, human and institutional characteristics</li> </ul> </li> <li>3. Natural subsystems <ul style="list-style-type: none"> <li>Terrestrial and aquatic - structure and function, diversity, extent, location, degree of intervention</li> </ul> </li> </ol>
Interactions	<ol style="list-style-type: none"> <li>1. Industrial production - interaction of materials, energy, water, labor, etc. Interaction of by-products such as heat, chemicals and particulates with man, agriculture and natural systems</li> <li>2. Agriculture production - interaction of solar and fossil energy, water, chemicals, soil minerals, equipment and technology. Interaction of by-products such as chemicals and sediments with infrastructure and natural systems.</li> <li>3. Natural systems - interaction of solar energy with water and inputs from other components such as runoff, sediments and wastes. Services to agriculture and man such as hydroperiod regulation, wind breaks, pest predator habitat, recreation, erosion control, etc.</li> </ol>
System outputs	<ol style="list-style-type: none"> <li>1. Agricultural products</li> <li>2. Water, air and water-borne contaminants, and sediments</li> </ol>

- System outputs
3. Industrial products
  4. Forest products and services to downstream systems such as water quality and hydroperiod regulation
  5. Emigrants
  6. Recycled gases, solids and liquids
  7. Hydroelectric energy production
- Background data
1. Physical and political maps
  2. Soils, geomorphology, hydrology
  3. Map and description of important ecosystems
- Environmental laws and regulations
1. Laws governing regional plans and planning
  2. Regulation or zoning of land use
  3. Laws governing highway construction, mining, channelization, etc.
  4. Laws regulating quantity and quality of the discharge of wastes into air, water and land
  5. Permission requirements for clearing land, cutting timber, mining
  6. Laws regulating commercial and sports fishing and hunting
  7. Laws establishing and protecting parks
  8. Requirements for permits and licenses
- Official and private agencies serving the project area
1. Ministries or institutes with actual or potential functions in environmental management
  2. Research and teaching institutions
  3. Private organizations and businesses with interest in environmental management

comes through classification of land capability and then comparing this with actual use. The Holdridge Life Zone system can serve as the basis for capability assessment. The system is based on readily available data on precipitation, temperature, and evapotranspiration associated with the latitude and elevation found in an area (Figure 6). The Life Zone can be further broken down into capability units based on local conditions of soil, slope, drainage, and climatic anomalies such as cloud forest conditions. Classification involves a team effort by an ecologist, forester, geomorphologist, soil scientist and agronomist. Each specialist prepares a map of limitations which are used to make a composite capability map. The capability map can be overlain with maps of roads, settlement patterns and actual and/or proposed land use in order to assess conflicts and opportunities (Tosi, 1975).

Analysis of a proposed project, first in the context of the dynamics of the regional model and second in comparison with land capability maps allows identification of constraints and potential conflicts. For example, a review of the other sectoral activities in a region would indicate whether a penetration road or an agrarian reform colonization project were in progress. These would obviously conflict with hydroelectric development due to the potential for sedimentation. Study of the capability map would indicate what uses would be most compatible with energy generation.

#### D. Conflict resolution and management opportunities

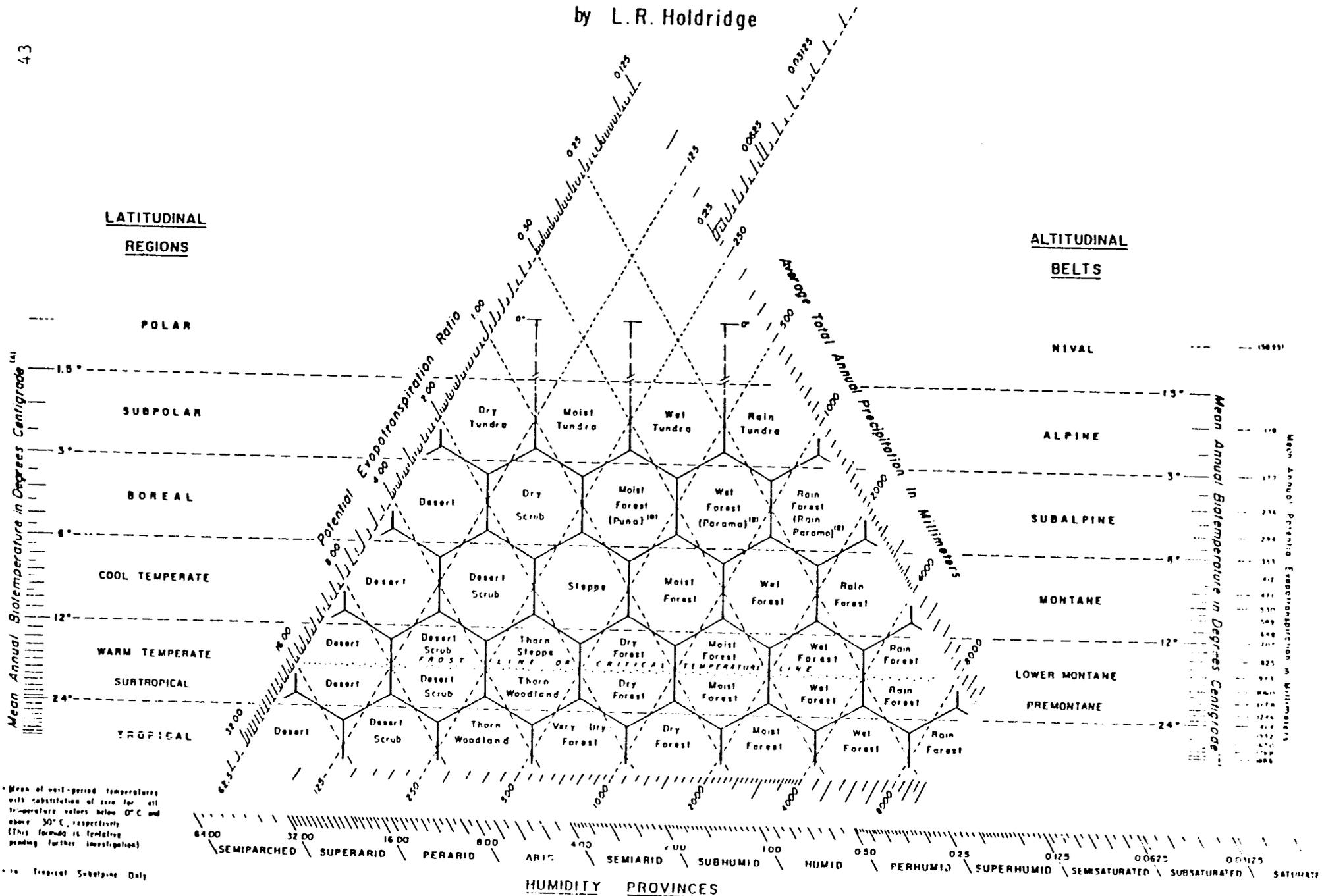
Proposed actions to either mitigate a conflict or take advantage of an opportunity involve a sequence of feasibility studies. These sequential steps are:

1. Ecological feasibility - the environmental sciences, such as ecology, forestry and agronomy, evaluate options based upon the opportunities and limitations inherent in the climate, soils and landforms of the study area.
2. Sociocultural feasibility - the rural sociologist or anthropologist evaluates the effect of a project based on the intended beneficiaries as well as those prejudiced through physical or economic displacement. The probability of acceptance of change, capability to apply new technology, and appropriate mechanisms for extension are also determined.

# DIAGRAM FOR THE CLASSIFICATION OF WORLD LIFE ZONES OR PLANT FORMATIONS

by L.R. Holdridge

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(14) Mean of wet-period temperatures with substitution of zero for all temperature values below 0°C and above 30°C, respectively (This formula is tentative pending further investigation)

(18) Tropical Subtropical Only

HUMIDITY PROVINCES

FIGURE 6

L. 258462 - 103706

3. Economic feasibility - presented with an array of options in agriculture and forestry that have been screened for ecological and sociocultural appropriateness, the economist can efficiently perform cost/benefit and marketing analyses to determine economic feasibility.
4. Institutional feasibility - the team has an overall input to the assessment of the technical competence, organizational structure and discipline of the public and private institutions that would provide support to a particular option.

#### VI. The Updating Process (6 pp.)

The Profile should be designed from the beginning to facilitate update at intervals not exceeding five years. Changes in state variables such as areas in certain types of agriculture or forest cover and changes in flows such as crop yields or fish catch can be compared. Such measures alone are only indicators, subject to measurement error, changes in criteria, etc., however when coupled with field checks and interviews, an accurate perspective can be gained on the state of the environment. Such an approach applied to specific development projects can yield invaluable data on the costs, benefits and conflicts.

Given the short memory of institutions, the tendency of reports to disappear and the frequent abandonment of long term experiments--a Profile task of creating a secure, but accessible, archive for environmental information should be considered. Locating such an archive in a PVO or private university would appear to be the best strategy. Funding on a continuing basis of data storage, cataloging and accessing service should be considered by the donor community because of the direct value to future projects.

#### 10.0 Relation of Profiles to other Donor Activities

Several independent processes are paralleling AID's Environmental Profiles in efforts to integrate the "environmental factor" in development planning and projects. These activities include World Bank's "Upstreaming" process, the IUCN National Conservation Strategies, and the UNEP Clearing House concept (not reviewed).

The objectives of the World Bank process are very similar to those recommended for the Profiles. "Upstream" refers to the strategic goal of incorporating environmental concerns in policy decisions prior to the formulation of specific projects (World Bank, 1983). Three of the objectives are:

1. altering the mix of projects so that environmental concerns are better represented. Called for is a more human scale and focus to Bank projects, less dependence on fossil fuels and massive infrastructure.
2. Improving the environmental qualities of individual projects. This is the on-going role of the Office of Environmental Affairs in sensitizing Bank staff. Upstreaming would reduce the flow of environmentally unsatisfactory projects.
3. Improved environmental advice to member governments. The Bank already provides extensive development counseling. This would include an environmental component.

The OAS Department of Regional Development has been involved in resource assessments since the mid-1960s. Studies have ranged in scale from a few person/months to several person years. The approach involves a holistic concept of the environment that includes both natural processes and those controlled by people. Through analysis of the environment by an interdisciplinary team a package of compatible development projects are proposed at the pre-feasibility level.

The National Conservation Strategies, an outgrowth of the World Conservation Strategy, seeks to provide a "strategic approach to the management of natural resource use." (IUCN, 1983). Free of the explicit mandate of AID and the World Bank to deal with the development problems of the "poorest of the poor", the NCS deals openly with the short-term sacrifices that would be entailed in achieving long-term sustainable development.

While AID has the longest history in national level environmental documentation, we are only talking about four years since the first Profile was prepared in 1979. Most Profiles prepared under AID funding have been available in quantity to professionals for less than a year. All parties, AID, World Bank and IUCN are in the process of reviewing their first efforts.

All three approaches are looked upon by those in the mainstream of development assistance as being either adversarial or somewhat irrelevant. In AID environmental considerations are legally mandated, but the spirit of applying environmental science expertise in development projects has been slow in coming. Much of the fault lies with us in the environmental movement. We have insisted on separating environment and conservation from development and thus effectively isolated ourselves from those we wish to influence, and worse, from those we ostensibly wish to help.

## 11.0 Background Concepts

### 11.1 Environment and Natural Resources

#### 1. Ghosts of Earth Day

There is decided nervousness among various organizations about the word "environment" and an attempt is underway to quietly scuttle the term and substitute "natural resources" as a more politically viable synonym. The two terms have usefully different meanings. These meanings are outlined below.

#### 2. Natural Resources

Natural resources, both renewable and non-renewable, are material goods the consumption of which are deemed necessary or desirable to maintain a given level of development. Plant and animal products, water and minerals are common examples. The (wise, rational or sustained yield) management of renewable natural resources for the benefit of present and future generations is a generally accepted, though widely ignored, concept in agriculture, forestry and hydrology. Hence, the term "natural resources" is familiar and unthreatening.

#### 3. Environment

Environment is a widely accepted term for the world around us. It is the array of dynamic ecological systems, terrestrial and aquatic, wild and human dominated, that support life. This ecosystem includes the physical substrate of land and water, the infrastructure of dwellings, factories and dams, the interacting living components and the tide, fossil fuel, biomass and solar energies that drive system processes.

#### 4. Goods and Services

Development, then, is the process of managing the environment to provide the goods and services required to sustain and improve human well-being. Goods are the natural resources defined above which are harvested or extracted from the environment. Services are those dynamic processes in the environment which directly or indirectly benefit society. These services have economic, social, cultural, scientific and ecosystem maintenance values for different constituencies. Examples include:

- The dynamic interaction of plants, soil and precipitation which results in aquifer recharge, regulated runoff of high quality water with a minimum sediment content.
- The combined biological and physical processes in an aquatic ecosystem which purify wastes.
- The role of tidal action in making coastal marshes and swamps as productive as intensively cultivated farmland.
- The recreational, aesthetic and scientific functions and values of natural and managed areas.
- The many processes such as nutrient recycling, soil formation, pollination and succession which make the sustained production of goods possible.

### 11.2 Development conflicts in the environment

Development for whom? Whose environment? In practice we are surrounded by as many environments as there are individuals, interest groups and sectors striving to improve their well-being. For example, in a single watershed overlap may occur among the interests of the power industry, indigenous groups, agricultural colonization, forestry, wildlife conservationists and fisheries. Inevitably the sectors and environmental components generating goods and services generate problems for each other.

These sectoral conflicts affect human well-being, and hence development. For example, sediments reduce electric power generation, pesticides kill food, fish and urban-industrial wastes affect potable water supplies downstream.

Development, as defined above is adversely affected when government fails to guide and control activities in the sectoral environments in order to resolve or minimize conflicts. These conflicts which limit development are called environmental problems. This identifies them among other inter-related development problems such as rapid population growth, inequitable distribution of resources, lack of education, dysfunctional institutions and high cost of fossil fuel energy.

### 11.3 Environmental management for sustainable development

Managing the overall environment for sustained development requires a systematic approach involving terrestrial and aquatic ecologists, the geomorphologist, experts in forestry, agriculture, fisheries and engineering working closely with the economist, social scientists, politician and

peasant. Environmental management includes both timely mitigation of development conflicts and a strong positive application of interdisciplinary expertise to increase the productivity of projects.

#### 11.4 The Profile

The Country Environmental Profile is an integral part of a country's development strategy. It serves as a benchmark establishing the state of the environment which supports development. The Profile also establishes a process for updating the status of the country's life support system and identifies development opportunities and conflicts.

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## Appendix I

## People Interviewed

Honduras

Ray Baum	AID Capital Development
Jorge Betancourt	CONSUPLANE/Peace Corps
Jaime Bustillo	Asociacion Hondurena de Ecologia (AHE)
Clarence Boonstra	Consultant
Paul Dulin	AID Choloteca Watershed
Manuel Hernandez	COHDEFOR (Forestry)
Francisco Membrillo	AHE
Ronald Nicholson	AID Deputy Director
Eloy Page	Rotary International
Dr. R.H. Stover	Tropical Ag. Res. Services La Lima
Mr. Russell Walker	AID Environmental Officer
John Warren	AID Environment and Technology
Stephen Wingert	AID Agricultural Officer

Ecuador

Luis Carrera	Consultant (Profile Coordinator)
Gary Hartshorn	TSC Costa Rica
Robert Jordan	AID Capital Development
Yolanda Kakabadse	Fundacion Natura
Enrique Laso	PNR (Forestry)
Jerry Lieberman	RARE Washington, D.C.
Fausto Maldonado	AID Rural Development
Patricio Maldonado	AID Ass't to Director
Dennis McCaffery	Regional Environmental Officer
Raúl Paredes	CONADE
Roque Sevilla	Fundación Natura

Dominican Republic

Ken Ellis	AID Agricultural Officer
Abel Hernandez	SURENA
Joe Kwaikowski	AID Agriculture
Stephen Miller	AID Rural Development
Merillo Morell	Park Service
Jaime Vinas Roman	Rector PHU University
Italo Russo	AID Agriculture

## Appendix 1 (Continued)

Dominican Republic

Philip Schwab AID Director

Zaire

Richard Peters AID Agricultural Officer

Upper Volta

Nihal Goonewardene ISTI (Contractor)

Washington, DC

Stephen Berwick	IIED
Luis Ferraté	AID
Robert Goodland	World Bank
John Guadet	AID East Africa
James Hester	AID LAC
Molly Kux	AID S&T/FNR
George Ledec	World Bank
Stephen Lintner	AID Middle East Bureau
Robert Otto	AID LAC
Michael Philley	AID Asia Bureau
Albert Printz	AID Environment
David Runnalls	IIED
Richard Saunier	OAS
James Sherburne	AID Africa Bureau
Sam Snedaker	University of Miami
Lee Talbot	Consultant (IUCN)
George Thompson	AID Africa Bureau
Dan Tunstall	Conservation Foundation
Diane Wood	IIED
Frank Zadroga	AID Reg. Env. Off. Central America
Harlan Davis	AID (ex-Panama Ag Officer)

## APPENDIX 4

### HOLISTIC PLURALISM AND THE ENVIRONMENTAL MOVEMENT

Where ecology is concerned, a change anywhere affects everything else. A change made today may well have a delayed impact 20, 30, even 40 years later. Furthermore, the success of the life experience of each of us is dependent on what other individuals all over the world do. Like it or not, we humans must live in harmony with nature. Although constant change is inevitable, so too is the certainty of resistance to change.

We are now in the midst of a major cultural revolution. There are many signs of a shift in the way people look at the world around them. This different view will influence the nature and the rate of change.

To be a good architect of change today calls for a holistic perspective--a comprehensive, worldwide, long-range view. It calls for a thorough assessment of the negative as well as the positive impacts of the change contemplated, not just near term, but over the long run. It calls for an understanding and evaluation of the interaction of the proposed change with other forces at work. We cannot afford the same old narrow, myopic approach to problem solving, which is, in my judgment, responsible for many of the difficult situations we face today. Nor can we let ourselves be drawn into that increasingly centralized approach toward which some advocate and many fear we are inevitably heading.

What we need is an approach that fully recognizes and reflects the fundamental interdependence of individuals, institutions, and nations at the same time that it nurtures and draws on the rich diversity of outlook and activity, which characterizes not only our society but all life.

We need, especially among leaders in every field of human endeavor, an approach I call "holistic pluralism"--in which each individual, institution, and nation takes the larger, longer view into account as each pursues its own particular interests and goals. Only through such an approach, in our incredibly and increasingly interdependent world, can we realistically expect to serve our own self-interests. We have reached that point in human history where--for our own survival, let alone for our continued success--we can no longer ignore, as we all too often have during our relatively brief duration here on Earth, the essential community of interests among humans everywhere and between humans and the Earth they inhabit.

When the National Audubon Society was founded, 75 years ago, its primary task was protection of wildlife from uncontrolled slaughter, which threatened to wipe out the game birds and animals and commercial species that were killed for their meat, hides, or feathers. The events of the following years--especially since Earth Day and the environmental revolution--have led the Audubon Society more and more into the holistic approach: Wildlife and human beings are all in the same boat. What we humans do to befoul our life-support systems--our air, water, and land--threatens all life. Conservation of wildlife and natural resources cannot be divorced from society's other concerns.

In the years ahead, the National Audubon Society and other conservation organizations must continue to further this broad perspective. We must provide our members with the information and inspiration they need to act as citizen leaders in the effort to bring human life into better harmony with nature.

The Audubon Society's plan of action serves that purpose. It encompasses interrelated objectives: to conserve the natural environment, including wildlife;

## Appendix 2 (Continued)

to advance a national energy policy whose central theme is to reduce energy waste and develop renewable energy resources; to prevent and abate pollution; to support wise land-use planning at all levels; to protect our public lands; and to cooperate in international conservation efforts, including the stabilization of human population and the long-term husbandry of the world's food production resources. Our members are pledged to promote ever-greater and broader understanding of these issues and to effect the changes that are essential to providing a decent quality of life for our children and their children.

Russell W. Peterson  
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BioScience, Vol. 29, No. 7, July, 1979, p. 399.