

The Country Environmental Profile  
Process and Product

An evaluation of Profiles conducted  
prior to 1983 and  
Recommendations for improvement

Part I  
Evaluation

Joshua C. Dickinson, III  
Consultant to the  
International Institute for  
Environment and Development

Agency for International Development  
Science and Technology/Forestry and Natural Resources

## SUMMARY

### Evaluation of AID Country Environmental Profiles

#### Profile objectives

1. Identify major existing and potential problems and areas of concern for natural resources and environmental management
2. Stimulate action on environmental problems
3. Identify environmental improvement projects for possible funding by AID and other donors

#### Issues

1. Have the Profiles accomplished the stated objectives?
2. What constraints have limited the effectiveness of the Profiles?
3. Do the Profiles provide information relevant to sustained development?

#### Objectives accomplished

1. A compendium of useful information on natural resources and their deterioration has been assembled
2. Awareness, if not action, on environmental profiles has been stimulated
3. Profiles are a sought after reference work

#### Objectives not accomplished

1. No systematic formula for environmental management evaluation has been developed
2. No environmental improvement projects have been identified
3. The population pressure/inequitable land distribution/environmental and life quality deterioration was not effectively addressed

#### Constraints

1. Failure to print enough Profiles initially coupled with interminable publishing delays resulted in diminished impact
2. Failure of most Missions to become involved with host government institutions in Profile development severely limited Profile influence
3. The sectoral approach of the Profiles with minimal synthesis precluded discussion of the intersectoral conflicts affecting the environment and development in the field

#### Conclusions

1. Profiles do not effectively communicate with those who, for better or worse, control and manage the environment to produce food, fibre, energy and construction materials. Profiles are prepared by and for environmentalists and conservationists. Profiles funded by and for an agency concerned with the well-being of the poor should contain information explicitly organized to serve that mission.
2. The environment is a complex system capable of providing, under appropriate management, a wide range of goods and services. Profiles should evolve a systematic approach to resolving the inevitable conflicts between demand sectors - hydroelectric energy or more farmland? Construction sand or beaches? Condominiums or green turtles?

## / / COUNTRY ENVIRONMENTAL PROFILES TO DATE

### Background

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. In all three cases Spanish language editions have been available in limited quantities in country (a preliminary version in Ecuador). English editions have been readily available to AID in the Dominican Republic and Honduras.

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. For other countries where Profiles have been prepared the documents were reviewed and selective telephone interviews conducted. These countries included Panama, Costa Rica, Bolivia, Upper Volta and Zaire.

### Goals of the Country Environmental Profile

Variously stated the goals, general objectives and purpose of the CEP 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.

## Dominican Republic Case

### 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 Fredrick 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. These counterparts had assembled materials and drafted some background material by the time the consultants arrived. 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

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, 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.

### Accomplishment of stated objectives

Objectives 1 and 2: ... to define environmental problems and trends, especially those related to the small farmer, 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.

An "analytic framework" was not provided, at least under that heading. An approach to analysis will be discussed in the section on the design of future profiles. 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.

#### Specific comments

The sections devoted to recommended actions and projects are generally weak. The recommendations are rarely more than a single sentence. No indication is given as to relative priority, feasibility, or cost of carrying out actions. Each chapter has its own set of recommendations on soils, watershed management, forestry, etc., with inevitable inconsistencies and repetition. The argument that conflict and duplication plague the solution of environmental problems applies as well to the Profile. This weakness is largely the result of a process that called for largely independent "sector analyses" followed by editing from the team leader. Integration was neither called for nor budgeted.

The major problems with the Dominican Republic Profile are in the Terms of Reference themselves. The Profile is dedicated to "resource conservation and environmental management" without ever stating why. One presumes that the Profile is in some way related to development, however this is not stated in the Objectives and Scope nor is the connection easy to infer from the text.

The approach to the environment of the Dominican Republic is essentially reductionist rather than systematic. Flora is treated in Chapter III and fauna in Chapter IV. The Life Zone concept is introduced in Chapter III to define and map the major ecological systems of the country and then totally abandoned as an ecological framework for discussing such intimately related elements as vegetation, wildlife, agricultural systems, soils and soil erosion, watershed management, water supply and people. Extensive tabular data on soils and production units is given without maps or even reference to maps. Chapter VII on coastal resources is devoid of any analysis of the effects of sediments, agricultural chemicals, or water impoundment and diversion on the viability of coastal ecosystems, especially the extensive mangroves in the Rio Yuna estuary.

The Executive Summary simply compresses the information in the main document rather than forcefully presenting the most important issues and their policy implications for executive consideration. Recommendations are so general as to be gratuitous, i.e. "expand reforestation programs" or "minimize interinstitutional conflicts and duplications."

Given the substantive counterpart contribution to the Dominican Profile by individuals from SURENA and other institutions, more generous recognition on the title page would have been appropriate.

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.

As mentioned earlier, the Profile failed to identify adequately "environmental improvement" actions and projects (which would also have development benefits). Had more emphasis been given to synthesis and recommendations this might have bridged the gap between problem definition and more concrete project identification. This is a particularly serious omission in the case of other donors such as IBD that lack the sophistication of AID in the environmental area yet have larger portfolios in highly sensitive infrastructural projects such as hydroelectric and highway development.

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

"I.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."

Given the indictment of the rural population as the cause of environmental degradation it is surprising that the CEP does not give more emphasis to education, particularly since AID is a major donor in this area. The opportunity to include an environmental component in the rurally oriented 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 and low productivity and poverty. The CEP objectives don't address the population/resource issue (carrying capacity) explicitly nor did the CEP process encourage synthesis. Therefore, the opportunity to present a convincing case for addressing the population/resource issue in future development strategy formulation was missed although the basic data needed was scattered through the independently developed chapters of the Profile.

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. Unfortunately, the case for family planning is built in the CDSS and ABS without reference to the resource base deterioration argument.

AID's development strategy, as represented by the following quotation, represents a formidable challenge to the environmental science perspective on development.

"A generation of experience in economic development has demonstrated the inevitable truth that development of an economy and of a higher standard of living depends more upon the stock of human capital than the size of the natural resources endowment of the economy" (CDSS - 1985, p. 26).

While a perfectly valid argument, it could be misconstrued to mean that the Dominican Republic should imitate a Singapore-Taiwan-Korea model of labor intensive manufacturing (a la Caribbean Basin Initiative) and ignore the maintenance of renewable source of goods and services such as energy, food, water and raw materials. Elements of support for a balanced development strategy can be inferred from the Profile, but it is not "user friendly" in this regard. It is oriented toward problems and conservation while its audience in the Dominican Republic and in AID are overwhelmingly concerned with solutions and development.

The problem orientation is particularly evident in agriculture and forestry. Erosion due to land mismanagement is thoroughly documented. Solutions such as agroforestry and forest management are mentioned only in passing and not followed up by project recommendations comprehensible to the ecologically naive development planner.

### The Honduran Case

#### 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 (CONSULANE). 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 and host government institutional commitment to the project was minimal. The designated AID counterpart left the country unexpectedly the day prior to team arrival. Others in the Office of Environmental and Technology assumed responsibility and provided excellent day-to-day backstopping. Interest by the agricultural and engineering officers was notably lacking.

During a three to five week period in July and August 1981 the team engaged in intensive field reconnaissance and interviewing. Three of the eight team members had recent and highly successful Peace Corps experience in Honduras which greatly facilitated contacts, access to literature and practical experience to guide other team members.

Team members each prepared reports which were typed on the AID Mission word processor. Consultants were able to edit printouts of their drafts. 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

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 professionals at the time of a site visit in September 1983. Copies from a large second printing have begun to arrive. The AID supported Honduran Ecological Association-(AHE) will play a major role in promoting and distributing the Profile.

Accomplishment of stated objectives

Objective 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.

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, re-forestation 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 coherent framework for designing concrete environmental management to projects. No priorities, feasibility or cost estimates are made to substantiate the recommendations.

Relation of the Profile to the CDSS and ABS

The Honduras CDSS for FY 83 is an update of the FY 82 version and has no direct link to the Country Environmental Profile. The CDSS expresses an overall awareness of the resource deterioration problem of Honduras. Under "Unfavorable Factors" related development efforts is found:

- 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).

This statement relates to a number of Profile recommendations in agriculture and watershed management.

In the ABS under Health it is noted that 90% of rural Hondurans lack an adequate diet (ABS 1985, p. 34). Given the humanitarian and political implications of this in the Central American context, it is unfortunate that the Profile did not give more effective coverage to possible solutions to the problem.

Other than a passive source of data and generic recommendations, the Profile has not been perceived by the Mission to a major contribution to make to the CDSS or ABS.

Specific comments

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.

Ideally the Profile should be an encouragement and useful tool for strategic planning. This and other Profiles are weak in this regard.

A Profile should be thoroughly footnoted. This would lend credibility to recommendations and allow readers to access pertinent information. The bibliography should be selective, annotated and include where material is located i.e. Juan Midence in Danli has the only copy, for example. Special attention should be given to locating maps, aerial photos and satellite imagery.

### The Ecuadorean Case

#### 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 in countries where an appropriate government agency does not exist 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. Having worked all their professional lives in Ecuador the team members were intimately familiar with the landscape, literature and problems of the country.

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.

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.

Failure to employ an Ecuadorean ecologist or to follow most of the ecologically oriented recommendations of Hartshorn weakened both the Diagnostico and subsequent Ecology and Development publications.

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 general list of obstacles and recommendations. The Ecology and Development document includes a general but thorough assessment of obstacles to solving problems including entrenched land tenure patterns, rapid population growth and institutional dysfunction. Recommended solutions to environmental problems are numerous and general. However, in the Ecology document a more selective, high priority list is discussed. Lack of technically and economically feasible project outlines rather than generic lists is a criticism common to all Profiles evaluated.

Ecology and Development - Comments

Galley proofs of this profusely illustrated book being published by Salvat 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 Fundación 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 illustrate 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 devoid of 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.

21

### Use of the CEP by AID Mission

Background and justification were the most commonly heard terms used by A.I.D. officials to describe the value of the Profile. New employees and consultants used 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 in Honduras. The Profile provided a concise overview of problems limiting productivity of the forest sector (personal communication, Clarence Boonstra). Similarly, profiles in Central America are being used as briefing documents for the Kissinger Commission (personal communication, Albert Prince).

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 will provide substantive background for a Bay Island Conservation Project now at the Concept Paper stage. According to Mission professionals, the justification role of the profiles applies within the Mission, in promoting a project in Washington and with government agencies.

In the Dominican Republic, the Mission director and agriculture officer played a dynamic role in organizing government participation prior to the consultant team arrival, allocating staff time to work with consultants and later to promote the project. Such involvement heightens knowledge of the Profile content and the potential for application. As mentioned earlier, the Profile played a substantial role in justifying support for the Natural Resource Management Project. In Honduras the Mission leadership did not substantively participate in the project. The originally designated A.I.D. counterpart left the country a few days prior to the consultant team arrival.

In Ecuador, A.I.D. involvement with the Profile has been minimal. The Fundacion Natura published 250 copies of a 1,400-page diagnostic study carried out by local experts. This voluminous document in Spanish has been little-used by A.I.D. The final product of the profiling process will be a book that analyzes the diagnostic study and makes recommendations. Some 5,000 copies will be printed and given wide circulation.

Use of the CEP 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.

Familiarity with a Profile has been greatest in the Dominican Republic, in part because it has been available in Spanish for the longest period. Other considerations include Mission commitment, early host country involvement, excellent promotion and a major natural disaster.

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.

Place of the Country Environmental Profile

Place in overall AID environmental policy

In compliance with the National Environmental Policy Act of 1969 (NEPA) AID's environmental procedures are defined in 22 CFR Part 216. These procedures have been concisely reaffirmed recently by the Administrator in a Policy Determination (PD-6, 1983):

It is AID policy:

1. To assist the less developed countries (LDCs):
  - (1) in building the institutional and scientific capacity required for identifying, assessing and solving their critical environmental and natural resource problems, and (2) with establishing programs to address natural resource management problems.
2. To ensure the environmental soundness and long-term sustainability of AID assistance programs and projects.
3. To promote environmentally sound development projects funded by multilateral and bilateral development assistance organizations.

While this Policy Determination goes on to state explicitly how environmental assessments contribute to item 2 above and comply with 22 CFR Part 216, the role of Country Environmental Profiles is less clearly stated.

Profiles are identified as a means of institution building and as a means for "understanding natural resource constraints to development" which applies to policy item 1.(1) above. In practice, the Statements of Work for CEPs evaluated have not included an institutional development component. In the Dominican Republic a local natural resource institution was incorporated in the CEP process with marked success on Mission initiative. More local involvement went into the Costa Rica CEP. In Bolivia, Panama, Honduras Upper Volta and Zaire Profiles were conducted by outside consultant teams drawing upon local professionals for information. 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 may be quite influential nationally.

The contribution of CEPs to promotion of environmental improvement projects financed by other donors is explicit in item 3 above and in the Statements of Work for most of the Profiles evaluated. The Profiles to date have failed to identify potential projects. The one to three sentence recommendations are generally valid but fall far short of a technically convincing outline.

The Natural Resources Defense Council (NRDC) gave top priority to completion of Profiles in all aid-receiving countries in their report

Aiding the Environment. The process is moving along in the direction, if not at the pace, recommended (NRDC, 1980).

#### Place in Development Project Planning Process

The place of the CEP in the Mission project planning process remains nebulous in practice. The CEP and CDSS (Country Development Strategy Statement) concepts both evolved and were adopted at about the same time 1978/79 (Freeman, 1980). The CDSS has been institutionalized while the CEP remains optional. Parallels, if not explicit inputs, can be inferred in the relation of the Dominican CEP to the CDSS.

The awkward relationship between the CDSS and CEP derives in part from the fact that the CDSS is, as its name implies, a development oriented document rooted deeply in AID's fundamental mission. The CEP, on the other hand, is exclusively a natural resources conservation document with equal emphasis given to soils and wildlife and to forests and pollution (Saunier, 1983). Definition of relation of the CEP content to development strategy is left up to the imagination of the reader.

As stated previously, the CEPs have not fulfilled their objective of identifying and promoting environmental improvement projects. Were they to do so, there would be a line in Figure 1 from the Profile box to a Concept Paper box thence to the PID box (or to an OPG project). This concept will be expanded upon in the recommendations section.

Figure 1 illustrates the general irrelevancy of environment to project planning, at least in the eyes of the draftor of the original figure. The Profile input is out of harm's way as a conceptual input to the CDSS while the IEE and EA occupy the smallest possible boxes at the other end of the diagram. The environmental component apparently does not warrant host government, Mission or consultant input.

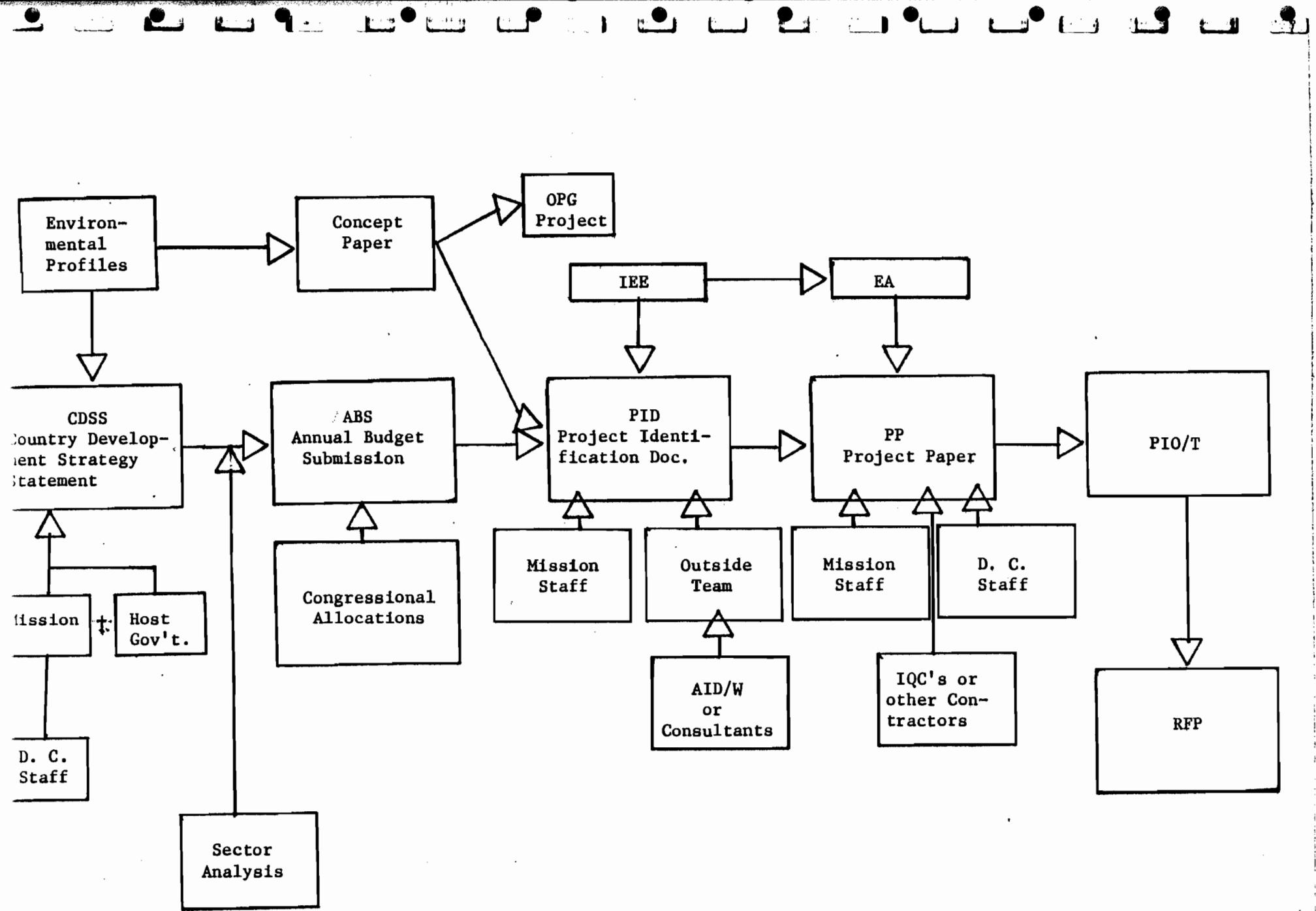


Figure 1. Development Project Planning Process.

1012

Conclusions

1. In terms of the goals of the CEPs, the identification of problems and the preparation of a compendium of data were accomplished. The identification of environmental improvement programs and projects was not accomplished, particularly as a stimulus to other donors. It is too early to determine if action on environmental problems has been stimulated. Awareness has certainly been increased.
2. The value of the Profile document derives largely from the process of local participation, the degree of Mission commitment and participation and extent of promotion given to the product. Based on these criteria, the Dominican Profile derived the greatest value from a product that did not differ greatly in quality from those prepared elsewhere.
3. A team effort involving local institution and AID Mission participation and close cooperation between local experts interacting with a small, select consultant group experienced in synthesis appears to be the best formula. Neither a hands-off local effort nor a foreign consultant strike force approach has worked as well overall. Paid local consultants assures accountability.
4. There are many excuses, but no good reasons, for delays of from one to three years from the time field work on a Profile was completed until enough copies were available to have an impact on potential users. Logistical and communication breakdowns have occurred among the AID Mission, AID Regional, AID Washington, contractors, editors and printers. Streamlining review procedures combined with a word processor--phone line--offset printing--linkage could greatly speed up the process.
5. The sectoral approach used in the Profiles effectively conveys information on problems associated with wildlife or soils or coastal resources. Totally missing is a synthesis discussing conflicts and coordination. Development projects are carried out in specific regions and affect, and are affected by, various sectors. Editors were only called upon to edit, no time was allocated for synthesis.
6. The AID Country Development Strategy Statement in the Dominican Republic is more explicit in identifying the relationship between population growth and natural resources than many of the Profiles (CDSS 1985, p. 60).

Grossly inequitable access to the land resource, and under-utilization of the most productive land coupled with reproductive incontinence are the principal underlying causes of deforestation, erosion and deteriorating water quality in the Western Hemisphere. Carrying capacity determination under different land management and population policy strategies is a conspicuously missing element in the Profiles to date.

7. In general Profiles have not provided a practical guide for finding information. Data in the text is not footnoted, the large bibliographies are not annotated and locations of books, reports and especially maps and photographs are not given. The latter problem is particularly serious because few copies of reports are printed, card catalogs are virtually nonexistent, individuals tend to squirrel away material and institutional memories are woefully short, including that of AID.
8. Institutional analysis is generally weak, due in part to an intractable problem. Visiting consultants lack the depth of local experience to fully analyze how an institution functions both internally and in interaction with other entities. The national counterpart, on the other hand, may know too much and thus is reticent to critically appraise his employer.
9. The Profiles treat the urban environment only in terms of pollution (liquid, solid, gaseous and noise), water supply and disease. Given the levels of increase in urban population, a broader, systematic approach to interactions with the hinterland involving resources and waste would be useful. Factors in the rural environment spurning migration should be tested. Intra-urban issues such as open space and energy efficiency should be considered.
10. The Profiles are prepared by and for conservationists. To the extent that the data base on environmental and natural resource problems raise consciousness and strengthens the hand of the relatively weak conservation groups and agencies, the effort has been useful. However, the documents do not communicate effectively with those concerned with human well-being and economic growth. This audience holds overwhelming power over actions affecting the environment. Their reaction tends to be one of indifference or defensiveness. The small environmental community in the developing countries will not cause much change as an adversary.

The data base is a good beginning but a project under the label "environmental improvement" (see Goals) would be considered to be of marginal relevance to the economist in a multilateral lending institution.

The Country Environmental Profile  
Process and Product

An evaluation of Profiles conducted  
prior to 1983 and  
Recommendations for improvement

Part II  
Recommendations

Jos̄hua C. Dickinson, III  
Consultant to the  
International Institute for  
Environment and Development

Agency for International Development  
Science and Technology/Forestry and Natural Resources

/ /  
RECOMMENDATIONS FOR FUTURE COUNTRY  
ENVIRONMENTAL PROFILES

The Process

Introduction. 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 and by AID.

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 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 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 Profile team leader.
3. Prepare with an ad hoc team of national and AID experts a preliminary matrix, conceptual model and working map defining 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 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.
6. The Mission, in coordination with the advisor and AID/Washington, will contract outside consultants in those areas needing outside expertise.

Profile workshop. The duration of this workshop 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--a media event with 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 prominent politicians.
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 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.

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.

The assessment process is described in detail in the section on The Product.

User guidance. A user's guide will be prepared to assist those in each target group; decisionmakers, agency professionals, AID officials, teachers, conservationists, etc.; find and interpret data and analyses in their own context. A detailed methodology will be available for those wanting to evaluate other issues.

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, t.v. 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.

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.

## A Country Environmental Profiles

### Table of Contents

- 1.0 Purpose of the Profile (2 pp.)
- 2.0 Cultural history of human interactions with the environment (3 pp.)
- 3.0 Country development goals (4 pp.)
- 4.0 The national environment (10 pp.)
  - 4.1 External interactions
  - 4.2 Country model
  - 4.3 Thematic maps
  - 4.4 Interaction matrix
- 5.0 Sector assessment (50 pp.)

5.1 Agriculture	5.8 Parks and wildlife
5.2 Forestry	5.9 Recreation
5.3 Fisheries	5.10 Urban infrastructure
5.4 Mining	5.11 People
5.6 Transportation	5.12 Education and research
5.7 Industrial	5.13 Private-Consultants, PVOs, etc.
- 6.0 Regional management units (50 pp.)
  - 6.1 Regional model
  - 6.2 Life Zones
  - 6.3 Policies, programs and projects
  - 6.4 Constraints and conflicts
  - 6.5 Conflict resolution and management opportunities
- 7.0 Program and project recommendations (15 pp.)
- 8.0 Updating process
- 9.0 Relation of Profile to other donor activities (4 pp.)
- 10.0 Annexes
  - 10.1 References cited
  - 10.2 Annotated bibliography
  - 10.3 Location of useful information
  - 10.4 Directory of environmental and social Sciences
  - 10.5 Bilingual glossary
  - 10.6 Directory of government agencies, PVOs, and consulting firms

### Elements of a Country Environmental Profile

#### 1.0 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. An inventory and accounting 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 units--an analysis of development conflicts and opportunities at the provincial or river basin level.

A detailed user's guide should be included to assist each potential user group. For example, in AID for use in Development Strategy and Project Paper preparation and in national planning and regional development programs.

#### 2.0 Cultural history of human interactions with the 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.

#### 3.0 Country development goals (4 pp.)

- 3.1 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.
- 3.2 Programs, project portfolios and policies of the international development assistance community.

#### 4.0 The national environment (10 pp.)

- 4.1 External interactions. This simple block diagram will illustrate the major inputs and outputs of the country (see Figure 3). This

national account 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 a serious foreign exchange drain worthy of assessment. Data indicating major exports of plantation crops or meat can be an indicator of possible land use conflicts.

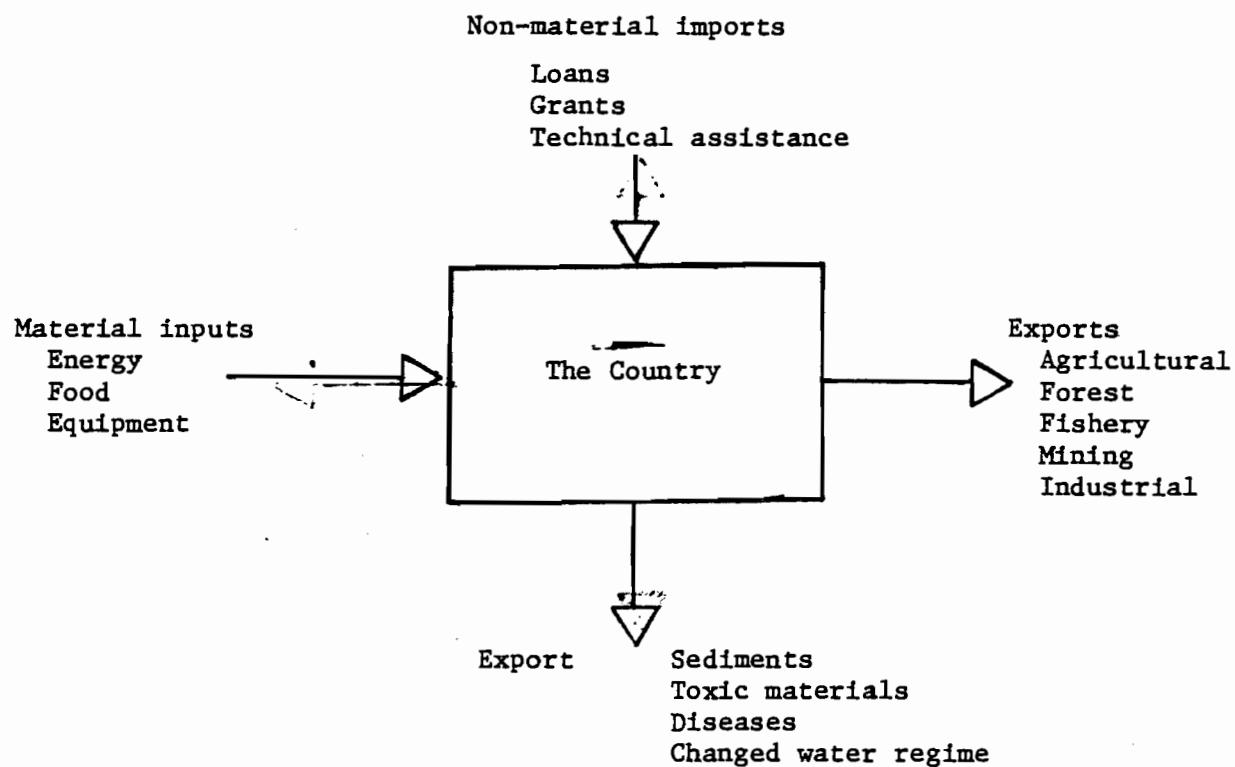


Figure 2. External interactions.

If the air, rivers, ocean currents or migrants carry harmful materials across national boundaries, internationally significant impacts may occur.

4.2 A country model (Figure 3) expands upon the simple box in Figure 2 to illustrate the role of environmental management in sustaining

the flows of goods and services in an economy. Line 1. represents those actions to sustain the flow of goods and services (Lines 3.

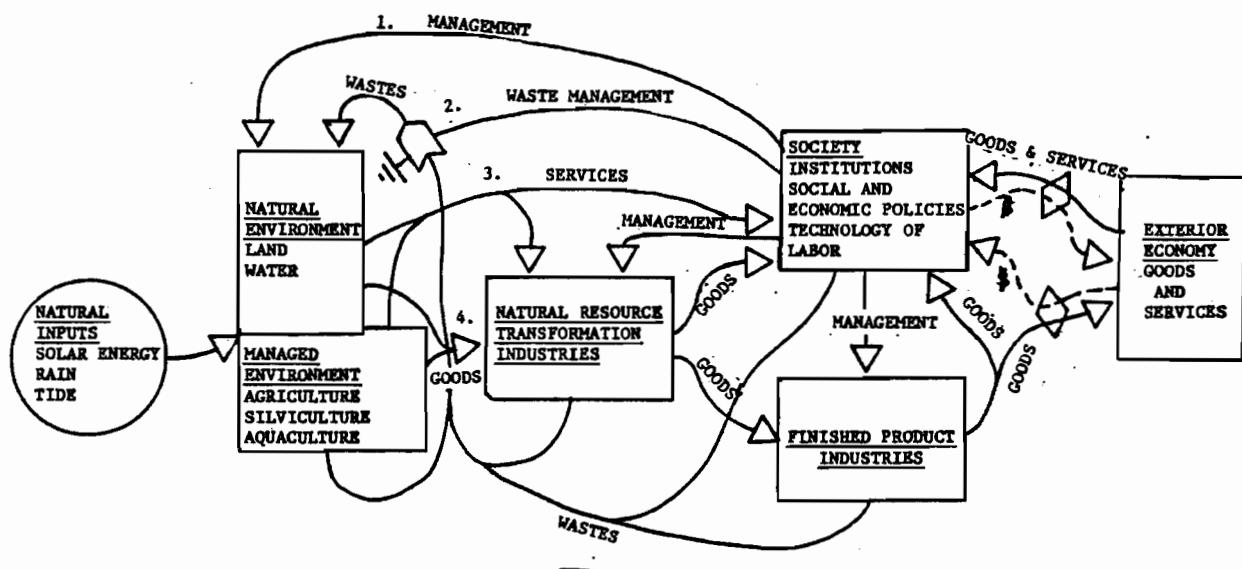


Figure 3. Conceptual Model of National System.

and 4.) to society and the resource transformation and Finished Product industries. Examples include watershed management, prevention of conflict between productive sectors and enhancement of the productivity of agriculture and forestry through environmental management technology. Line 2. represents those actions in waste management designed to reduce or direct urban-industrial waste streams so that they can be absorbed and utilized by natural and managed ecosystems without impairing the quality or quantity of

goods and services benefiting society. A prime example of the interdependence of type 1. and 2. management actions is in maintenance of a clean water supply for urban-industrial use. This involves applying best management practices on farmland to minimize agricultural chemical runoff and maintenance of streamside vegetation and natural channels (type 1. actions) and the recovery of toxic chemicals (mercury, cadmium, etc.) and the inexpensive secondary treatment of organic wastes in settling ponds and marshes prior to discharge to flowing waters (type 2. actions). Figure 3 can be greatly expanded during the Workshop phase of the Profile process to include identification of specific sectors and management issues.

- 4.3 To support model development thematic maps, surveys and reports should be collected to help identify the sectors, resources, spatial patterns and interactions unique to a particular country.
- 4.4 An interaction matrix plotting sectoral activities on both axes will permit the rapid identification of potential conflictive and complementary interactions between sectors. (Figure 4) Other sectoral activities not shown on the sample matrix are:

Annual crops	Lake fisheries
Agroforestry	Aquaculture
Wet Rice	Strip mining
Industrial crops	Biomass energy
Plantation forestry	Geothermal energy
Recreation	Human settlements
Estuarine fisheries	Riverine transportation
Coral reef fisheries	Highways
River fisheries	

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	12
Watershed management					13	14
Parks and wildlife						15
Hydroelectric energy						

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 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 (taungya) 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.

## 5.0 Sector assessment (50 pp.)

This section will be a compendium of national scale "mini-profiles" of each major sector. A typical list would include:

- |                    |                                      |
|--------------------|--------------------------------------|
| 5.1 Agriculture    | 5.8 Parks and Wildlife               |
| 5.2 Forestry       | 5.9 Recreation                       |
| 5.3 Fisheries      | 5.10 Urban infrastructure            |
| 5.4 Mining         | 5.11 People                          |
| 5.5 Energy         | 5.12 Education and Research          |
| 5.6 Transportation | 5.13 Private-Consultants, PVOs, etc. |
| 5.7 Industrial     |                                      |

Common elements in each sector analysis will be the following with adaptations to accommodate the differing characteristics of each sector:

1. Identification of the sector components. In agriculture, for example, they might include small farms, cattle ranches, industrial farms and agrarian reform projects. In energy, major hydroelectric projects, small hydro programs, fuelwood use or biomass/alcohol projects, geothermal and thermoelectric could be the major components.
2. Detailed sector input-output analyses establishing resource accounts. Changes in these accounts can be measured when the Profile is updated. Any input to or output from the sector should be identifiable as an output or input from other sectors. Figure 5 offers as typical examples mining and estuarine fisheries. The major difference between these two is that mining is based upon a stock resource, a nonrenewable mineral and is a heavy user of fossil fuel resources in extraction and processing, which fish represent a single flow resource product from a complex natural ecosystem. Quantification and analysis of these sector models can help raise questions about energy, material and economic cost/benefit, sustainability of rates of production. From the fishery model one can appreciate various types of stress, such as wastes and water diversion. As various sector models are completed, outputs and inputs can be linked, evaluated and management options explored.

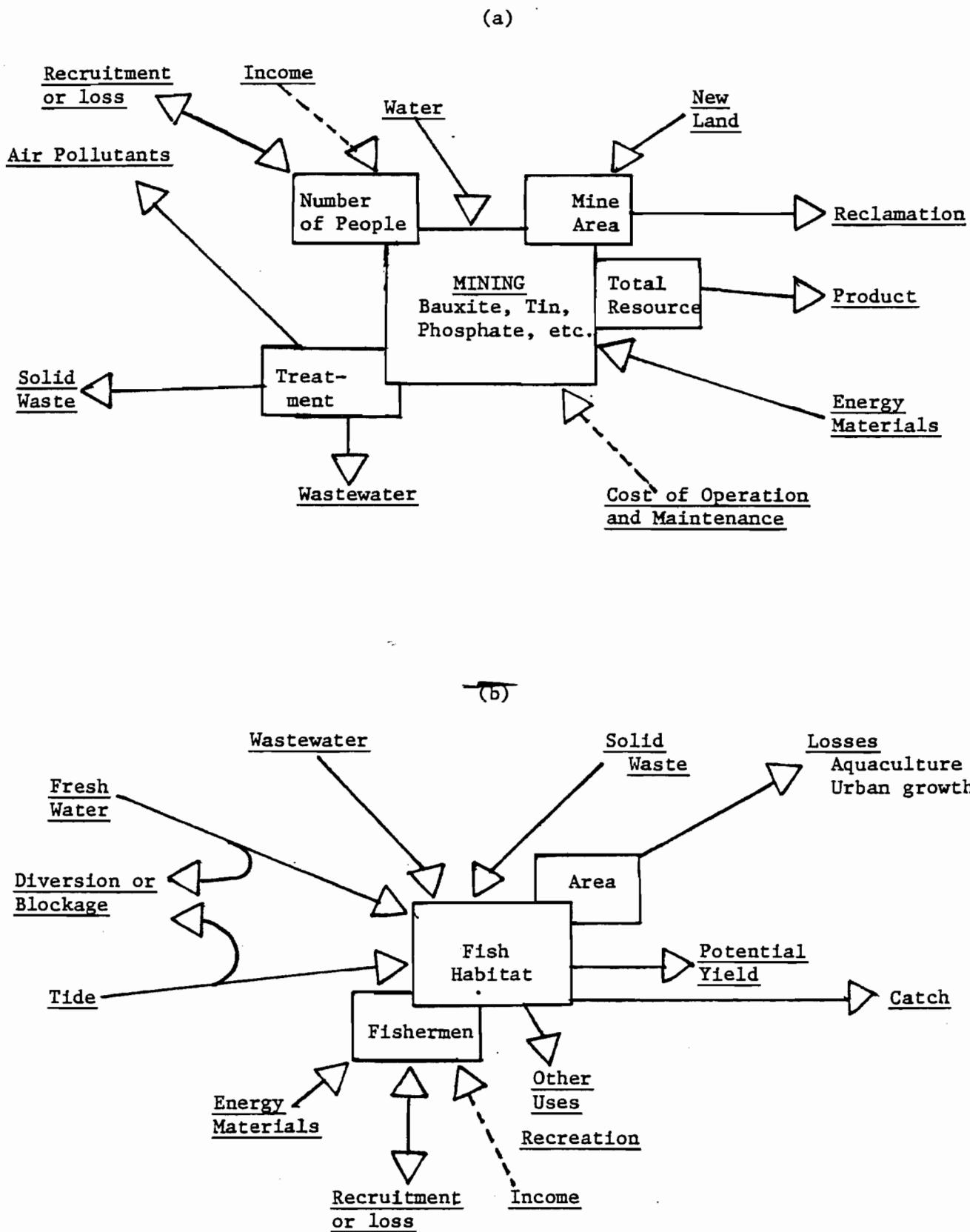


Figure 5. (a) Mining sector input-output. (b) Estuarine fishing sector input-output.

3. The institutions which serve each sector will be analyzed in a manner similar to that applied to the sectors themselves. 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.

4. 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 or are they militant against pollution?

5. The evaluation of consulting companies and Private Voluntary Organizations should include, in addition to the ecologically and environmentally oriented, those powerful groups whose activities affect the environment such as engineering societies, industrial associations, agricultural associations and civic clubs.
6. This section should review those basic characteristics of the population which affect environmental management and development and which reflects the quality of life and the human environment. 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. Demographic data - population growth rate, mortality, life expectancy, density, rural/urban comparisons.
  4. Economic indicators - employment by sector, unemployment, income by sector, migration, urban/rural comparisons.
  5. Health - incidence of environmentally related diseases.

#### 6.0 Regional management units (50 pp.)

Virtually all development activities have a primary focus at the local level with secondary or demonstration effects within a distinct region. The Profile should focus on a convenient scale of regional analysis determined by existing planning strategy, the size and complexity of the country and the Profile budget. The river basin unit is the most convenient. The national overview with its generic interaction matrix (Section 4.3) and the sectoral evaluation in Section 5.0 are applied at the regional level actual projects and environmental conditions.

##### 6.1 Regional model

The failure to perceive the planet or a region as a system composed

of interacting natural and man-controlled components and processes often blinds development planners to the value of certain kinds of expertise, technology, and information that would make using and protecting the system easier. A valid defense against this myopia is through the management of an interdisciplinary team and some form of systems analysis, such as a regional systems model.

While all systems models abstract and simplify reality, they do eliminate superfluous detail and allow the lines of complicated processes to emerge clearly. As an example, the highly simplified model in Figure 3 focusses attention on a regional ecosystem's key elements and interactions as the basis for understanding relationships and identifying potential conflicts. In brief, it involves several steps.

First, the region's limits and major component ecosystems are identified. While all ecosystems have arbitrary limits, the Principle of Integrative Levels indicates that a system is best understood through analysis of the next-higher system. (To understand a river and its floodplain, for example, analyze the watershed.) Applying this principle, each discipline or sector can see how a given boundary affects its analysis. Once boundaries (whether a river basin or an administrative unit) are decided upon, internal interactions can be distinguished from exchanges with other systems--a prerequisite to identifying system inputs and outputs later.

Second, the scale is defined (or better, several different scales are defined depending on the objective). Since the location of a highway requires a radically different model in scale than that needed to optimize development for a region, the models are fine-tuned to identify the quality and types of information available (or unavailable) to each discipline or sector.

Third, components or subsystems are identified in detail. In any regional model, the major divisions are natural systems (terrestrial and aquatic), managed systems (such as agriculture or silviculture), and such infrastructural components as cities or dams.

Fourth, inputs and outputs are identified. All the outside human resources, material, and information that affect the systems as

delimited in step one are listed. These may include sunlight, rainfall, tidal action, tectonic movement, fuels, goods, technology, immigration policies, etc. all of which interact. Outputs could include water, immigrants, residuals, heat, goods, services and so on. The more complex the region, the more important it is to identify system components and process and their external interactions with external systems through interdisciplinary discussion.

Fifth, the systems diagram is prepared. Symbols are attached to each characteristic of the system and connected by lines representing flows of energy or materials and information. The finished product is a dynamic diagram of the region that enables planners to identify major components processes and interactions among socio-economic sectors or interest groups (i.e., conflicts and support functions).

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 (Saunier, 1983).

The regional model is an expansion upon the overall structure of the national model in Figure 3. The sectors analyzed in Section 5.0 would become the components of the regional model using specific cases.

#### 6.2 Life Zones

A major contribution to the understanding of a region and its 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).

#### 6.3 Policies, programs and projects

An inventory of current and proposed projects including a description of the underlying institutional and national policies and programs provides the basis for regional assessment.

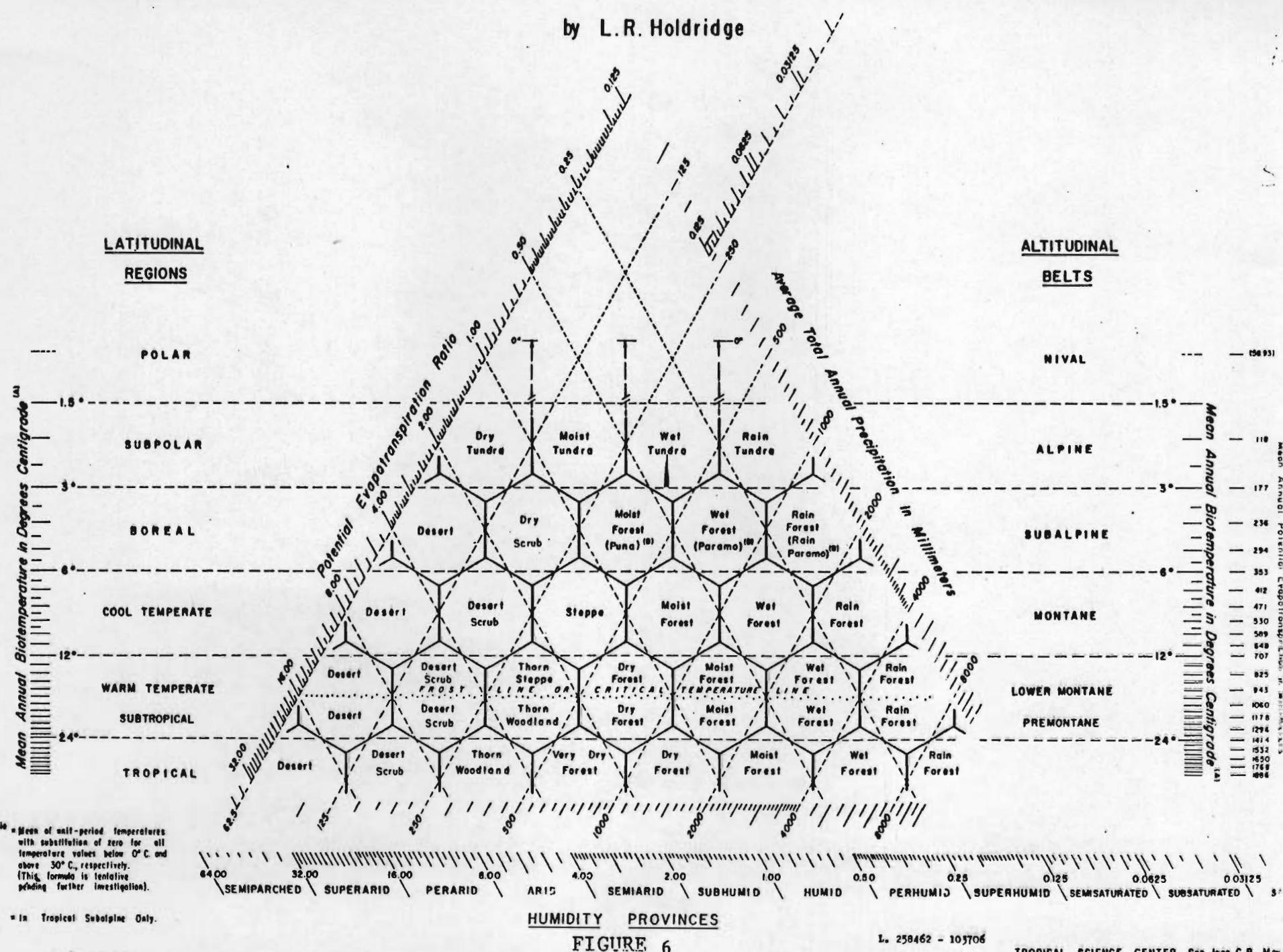
#### 6.4 Constraints and conflicts

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, if the region, a review of the other sectoral activities 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.

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

by L.R. Holdridge

20



### 6.5 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.
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.

Most procedures used in "environmental" studies are negative, being oriented toward problem identification and hopefully mitigation. Much less attention has been given to applying the environmental sciences to finding development opportunities. Two examples will illustrate the opportunity approach:

- Reforestation has been misconstrued to be virtually the only means to restore areas degraded by overgrazing and subsistence farming. Trees are planted on sites no commercial forester would consider. The approach cannot be extended beyond pilot projects because it is prohibitively expensive, unattractive to farmers, relatively ineffective and difficult to maintain. Two alternatives

are to initiate natural succession with agroforestry systems coupled with soil conservation practices giving farmers both short and long term income, or second, to apply the same fire and grazing exclusion that would be applied to protecting a plantation but let natural succession to begin watershed recovery without the expense of tree planting.

- Agricultural scientists and research facilities are overwhelmingly dedicated to single crops. Tremendous expenditures are made to force monoculture production despite environmental constraints. The ecologist acting as an agronomist seeks complementary crop and animal ecosystems adapted to particular Life Zones which require less expensive chemical and energy subsidies.

#### 7.0 Program and project recommendations (15 pp.)

The purpose of the recommendations is to provide the country, AID and other specifically selected donors with recommendations that constitute pre-feasibility studies or, in AID terminology, a detailed outline of a Concept Paper. The recommendation should receive the type of feasibility screening outlined in 6.5 above. Emphasis will be upon innovative development projects designed to sustain the flow of goods and services which support development. A major challenge is the design and testing of a mix of protective and productive activities in the watersheds of major infrastructure projects which significantly improve the economic well-being of the population while maintaining the water quality requirements for downstream users.

Other recommendations may include policy formulation, institutional development, education and research. Research is particularly important. Recommendations should focus on significant gaps of knowledge revealed during the Profile process.

Recommendations should outline verifiable objectives for projects to facilitate evaluation in future Profile updates.

#### 8.0 The updating process

The Profile should be designed from the beginning to facilitate update at intervals not exceeding five years. The system and sector

models in Figures 2, and 3 are designed to provide easily updated accounts. 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, a valid 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.

#### 9.0 Relation of Profile to other donor activities (4 pp.)

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). The four 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.
4. Improving the environmental performance of other development institutions (e.g., IDB, ADB, OAS, EEC, bilaterals and PVOs). This would involve an outreach process through seminars, conferences and informal exchange.

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.

## The Place of Future Country Environmental Profiles

### Place in the overall AID environmental policy

There is a crucial divergence between AID's environmental policy and its fundamental development mission. Environmental policy is overwhelmingly problem oriented, while development is a search for opportunities, an intrinsically positive mission. Not recognized is the significant positive contribution that a timely and systematic application of environmental science expertise could make to development. This includes, but is by no means limited to, land capability assessment, design of higher net yield agricultural systems, multipurpose forest management and low cost waste treatment.

Environmental Assessments. No where is this negative caste more entrenched than in the Environmental Assessment process. Forced upon AID as an extension of the National Environmental Policy Act assessments are looked upon by many in the field as a costly Congressionally mandated chore unrelated to development. The Environmental Analysis Policy (PD-6, 1983) reinforces a one sided, negative approach. "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."

That an Environmental Assessment can be transformed into a development assessment and become a fully integrated part of Project Paper preparation can be illustrated by recent AID experience in Peru. The Upper Huallaga project involved coca eradication and hence was highly controversial, triggering an Environmental Assessment. The Project Paper consultants failed to produce a satisfactory document and the project manager was forced to use much of the EA team's alternative agricultural systems design to produce the Project Paper. Based on the fortuitous success in the Huallaga project design, the Palcazu Project was designed from the outset with the Environmental Assessment generating options for the Project Paper (Network, 3/83).

In Egypt the Environmental Assessment of a major (\$1.2 Billion) wastewater management project was used imaginatively to broaden the scope of the feasibility study. Because of the legal status of the Assessment it could be used to leverage decisions that would otherwise become contentious professional

or political issues. Leverage was exerted both by AID and by one Egyptian institution upon another (Pers. Com., Stephen Lintner). The Niger Livestock Project used the Initial Environmental Evaluation (IEE) as the vehicle for a comprehensive inventory of ecological and natural resource information (Pers. Com., George Thompson).

A fundamental change in the focus and use of Environmental Assessment procedures to both enhance development directly as well as to mitigate negative impacts is possible without violating the spirit of NEPA or the letter of 22 CFR Part 216. In fact, such an approach is clearly advocated in the Purpose of NEPA. Broader application of "a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decision making . . ." (NEPA, Section 102(2) (A))--would have two significant benefits.

First, AID would be assured that development project design would benefit from the broadest technical input. Second, the PD-6 policy objectives of "building the institutional and scientific capacity required for identifying, assessing and solving their critical environmental and natural resources problems. . . ." can be achieved more effectively in both Assessments and Profiles.

Environmental Assessments have been an integral part of AID's formal procedures for more than a decade, yet the examples of compliance with the spirit of the regulations are the exceptions rather than the rule. The majority of mainstream AID officers simply do not consider "environment" to be relevant to development. Given this attitude it is no wonder that neither Assessments nor Profiles have been used regularly as a vehicle for building environmental institutions in host countries. Assessments are conducted only when there is the threat of legal action or the letter of the law permits no escape. An AID officer in the Dominican Republic used the term "blackmail" figuratively to describe how they were convinced of the value of doing a Profile.

Country Environmental Profiles will find a place in overall AID environmental policy when environment is accepted as a legitimate development concern by AID professionals. Unfortunately environment as reflected in the Assessment procedures and in the Profiles is only marginally relevant to AID's mission. The environmental movement in general has taken great pains to distance itself from development and in the process, poor people. Now we saw that

development really depends on a functioning environment, but no one is listening very carefully in the budgeting session, or the corridors of the Bank or in the backwaters of Olancho.

In the wording and approach advocated in these recommendations for future Environmental Profiles an overt effort has been made to present a convincing case for the role of the environmental sciences in development.

#### Place in the Development Project Planning Process

Figure 7 illustrates an expanded role for environmental science inputs in general. Retained is the input to the CDSS which should have a strategic planning role in influencing the focus and mix of future projects, much along the lines of World Bank's "upstreaming" concept.

The Initial Environmental Evaluation (IEE) of the future will be strengthened by the Profile allowing the draftor to determine how a potential project might interact with the environment positively as well as negatively. The Country model (Section 4.1) and appropriate sector and regional models in Sections 5.0 and 6.1 of the Profile will help. Should any interaction be found, the revolutionary idea of following up with an Environmental Assessment would be pursued, not because of rumblings from Cultural Survival or Friends of the Earth, but because the environmental sciences might have something useful to contribute. For example, in the case of a community wastewater collection and treatment proposal, typically the AID engineer and his counterpart in the health ministry would simply dust off and adapt a package plant design and a "Negative" (no impact) IEE would be submitted. Alternatively, an environmental assessment (perhaps a team of two) would explore the linkage of urban waste with an agricultural/aquacultural system, then employing an existing swamp for final polishing before effluent water reaches the river. Formally included in the Assessment process would be the feedback of basic environmental information to update the Profile data base.

The Profile will serve a basic reference for Concept Paper preparation. Section 7.0 will contain outlines for high priority items either as the basis for AID projects or for promotion with the government and other donors. Although AID is not into major infrastructural projects, its major current commitment to environmental management (natural resource and forestry projects) and to integrated rural development would have a synergistic effect if

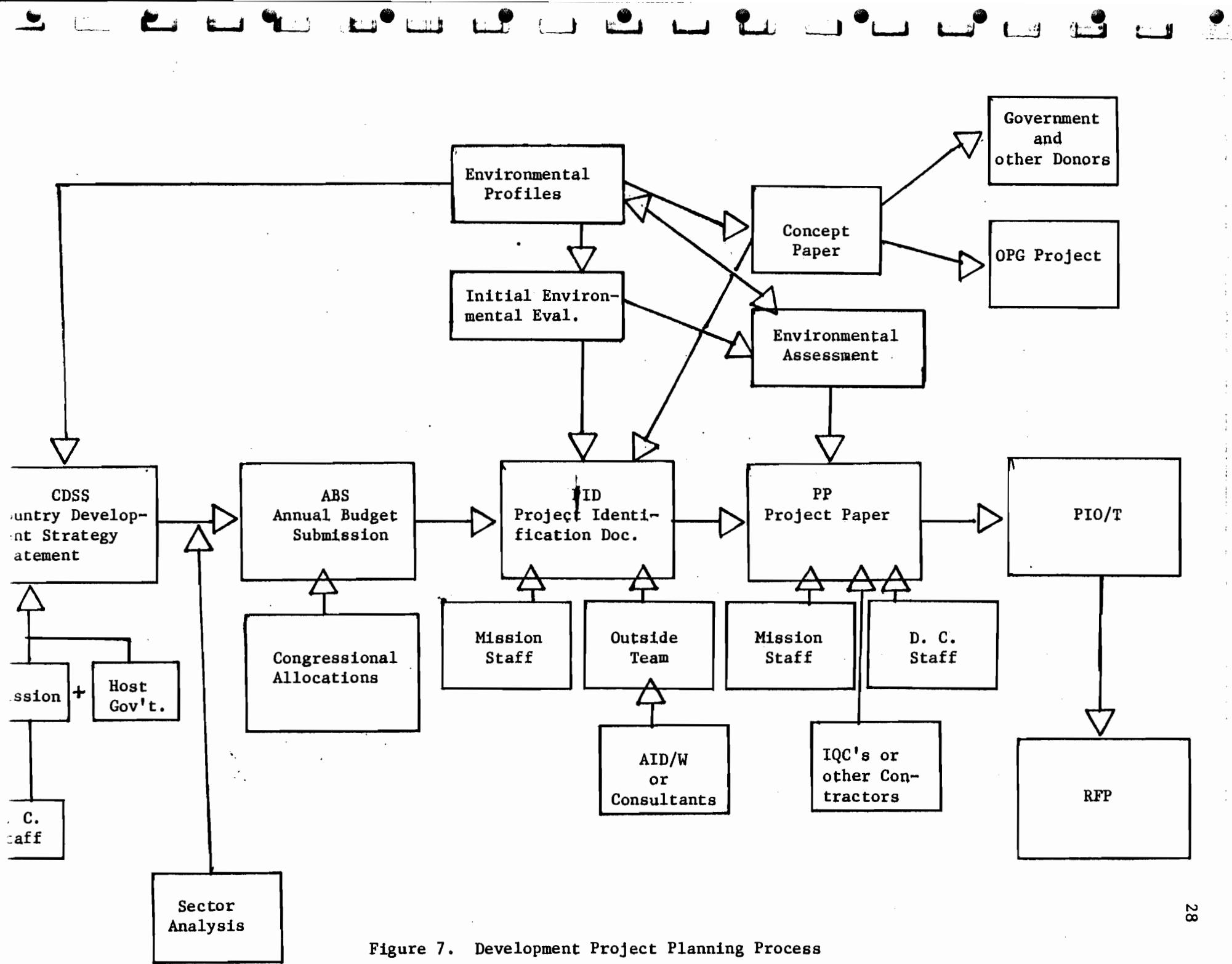


Figure 7. Development Project Planning Process

combined with IBD/WB projects where watershed management is sorely neglected. Why couldn't AID/Honduras have a natural resource management project in the Cajon Dam watershed rather than the Choloteca or integrated rural development in Ecuador's Paute or Postoza watersheds rather than in the Salcedo area? Section 6.3 will identify such opportunities which then would be detailed as project concepts in 7.0.

## Background Concepts

### Environment and Natural Resources

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. An Orwellian transposition would both impoverish our vocabulary and weaken our potential contribution to development.

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.

Environment. Environment is the layman's 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 interacting living component and the tide and solar derived energies that drive system processes.

Goods and Services. Development, then, is the process of managing the environment to produce 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 goods and 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.

Because of the intrinsic differences between goods and services it does not make sense to substitute a more limited concept, natural resources (goods) for a more dynamic and inclusive term, environment when talking about development.

### 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 intersectoral 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 interrelated development problems such as rapid population growth, inequitable distribution of resources, lack of education, dysfunctional institutions and high cost of fossil fuel energy.

### 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 scientist, politician and peasant.

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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