PN-AAX-838

World Wildlife Fund
United States Agency for International Development

The Matching Grant
for

Wildlands and Human Needs: A Program Evaluation

by Dennis McCaffrey and Helena Landazuri

Grant No: PDC-0268-G-SS-5092-00
Period Covered: Oct. 1, 1985 through Sept. 30, 1987
Date: September 30, 1987

WORLD WILDLIFE FUND

World Wildlife Fund
United States Agency for International Development

The Matching Grant
for

WILDLANDS AND HUMAN NEEDS: A PROGRAM EVALUATION

by

Dennis McCaffrey

and

Helena Landazuri

Grant No: PDC-0268-G-SS-5092-00
Period Covered: Oct. 1, 1985 through Sept. 30, 1987
Date: September 30, 1987

WORLD WILDLIFE FUND

WILDLANDS AND HUMAN NEEDS:
A PROGRAM EVALUATION

Table of Contents

		Page
1	OVERVIEW	1
1.1	Theme	1
1.2	Objectives	1
1.2.1	Testing Assumptions	1
1.2.2	Selecting Sites	2
1.2.3	Devising a Methodology	2
1.2.4	Accomplishing Development Projects	2
1.2.5	Attaining Conservation	3
1.3	Assumptions	3
1.4	Institutional Strategy	4
2	RELATION OF THE WILDLANDS AND HUMAN NEEDS PROGRAM TO OTHER WORLD WILDLIFE FUND ACTIVITIES	5
2.1	Historical Perspective	5
2.2	Current Situation and Future Trends	5
2.3	Level of World Wildlife Fund Involvement	6
3	EVALUATING THE WILDLANDS AND HUMAN NEEDS PROGRAM	8
3.1	Program Achievements and Constraints	8
3.1.1	Institutional Aspects	8
3.1.2	Social Aspects	10
3.1.3	Technological Aspects	11
3.1.4	Reserved Areas Management Aspects	12
3.1.5	Legal Aspects	13
3.2	Program Management	14
3.3	Program Funds Application	15
3.4	General Program Conclusions and Recommendations	17
4	EVALUATING FIELD PROJECTS WITHIN THE WILDLANDS AND HUMAN NEEDS PROGRAM	20
4.1	General Project Characterization and Achievements	20
4.1.1	Gandoca, Costa Rica	20
4.1.2	Southeast Coast, Saint Lucia	21
4.1.3	Manantlan, Mexico	21
4.1.4	Sian Ka'an, Mexico	22
4.1.5	Pacaya-Samiria, Peru	22
4.2	Constraints to Achieving Project Objectives	23
4.2.1	Credibility	23
4.2.2	Innovation	24
4.2.3	Risk	24
4.2.4	Transferability	25
4.2.5	Management	25
4.3	Field Evaluation of Five Projects	26

I	GANDOCA, COSTA RICA	27
I.1	Site Description	27
I.1.1	General	27
I.1.2	Land Use	27
I.1.3	Infrastructure	28
I.1.4	Protected Areas	29
I.2	Project Description and Analysis	29
I.2.1	Introduction	29
I.2.2	Agroforestry	29
I.2.3	Conservation	30
I.2.4	Land Titling	31
I.2.5	Management	32
I.3	Social Aspects	33
I.3.1	The Settlements	33
I.3.2	Community Organization	34
I.3.3	Community Participation	35
I.3.4	Relevant Socio-economic Factors	36
I.3.5	Technical Assistance	37
I.4	Institutional Aspects	38
I.4.1	Institutional Arrangements	39
I.4.2	Profile of the Principal Implementing Institution: ANAI	40
I.4.3	Associate Implementing Institution: CIDESA	42
II	SOUTHEAST COAST, SAINT LUCIA	44
II.1	Site Description	44
II.1.1	General	44
II.1.2	Land and Natural Resource Use	44
II.1.3	Protected Areas	45
II.2	Description and Analysis of the Project	45
II.2.1	Protection of the Maria Islands	45
II.2.2	Fishing Community at Pierrot/Savannes Bay	46
II.2.3	Charcoal Producers at Mankote Mangroves	46
II.2.4	Sea Moss Production	47
II.2.5	Sea Egg Management	48
II.3	Social Aspects	48
II.3.1	Project Beneficiaries	48
II.3.1.1	Charcoal producers	48
II.3.1.2	The Palmiste fishermen	50
II.3.1.3	The seamoss growers	51
II.3.2	Project Strategy	51
II.3.3	Local Constraints upon the Project	52
II.4.	Institutional Aspects	53
II.4.1	Institutional Framework	53
II.4.2	Profile of the Pincipal Implementing Body: ECNAMP St. Lucia	55
II.4.4	Collaborator and Possible Successor Institution: National Research and Development Foundation	57
III	SIERRA DE MANANTLAN, MEXICO	59
III.1	Site Description	59
III.1.1	General	59

III.1.2	Genetic Resources and Biological Diversity	59
III.1.3	Natural Resources	59
III.1.4	Land Use	60
III.1.5	Natural Resource Management	60
III.1.6	Protected Area	61
III.2	Project Description and Analysis	61
III.2.1	General	61
III.2.2	Research	62
III.2.3	Education	62
III.2.4	Development Activities	62
III.2.5	Planning and Management	63
III.2.6	Public Information	63
III.3	Social Aspects	63
III.3.1	Relationship of Communities to the Reserve	63
III.3.2	Factors Affecting Community Relations	64
III.3.3	Role of the Laboratorio in Community Relations	65
III.4	Institutional Aspects	66
III.4.1	Background and Objectives	66
III.4.2	Institutional Structure	66
III.4.3	Financial Support	67
III.4.4	Relations with Other Institutions	68
IV	SIAN KA'AN BIOSPHERE RESERVE, MEXICO	70
IV.1	Site Description	70
IV.1.1	General	70
IV.1.2	Natural Resources	70
IV.1.3	Archeological and Anthropological Resources	71
IV.1.4	Infrastructure	71
IV.1.5	Land and Resource Use	71
IV.1.6	Protected Area	72
IV.2	Project Description and Analysis	72
IV.2.1	Baseline Studies	72
IV.2.2	Development and Management Projects	72
IV.2.3	Wildlife Projects at Chunyaxche	73
IV.2.4	Ecotourism	74
IV.2.5	Publicity	74
IV.3	Social Aspects	75
IV.3.1	Social Groups at Sian Ka'an	75
IV.3.2	Collaboration with the Fishermen	75
IV.3.3	Problematic Aspects of the Social Situation	76
IV.3.4	Additional Observations	77
IV.3.5	Synopsis and Recommendations	77
IV.4	Institutional Aspects	78
IV.4.1	Institutional Structure for Managing the Reserve	78
IV.4.2	Project Implementation	79
IV.4.3	Analysis of Amigos de Sian Ka'an	80
V	PACAYA-SAMIRIA, PERU	83
V.1	Site Description	83
V.1.1	General	83
V.1.2	Natural Resources	83

V.1.3	Protected area	84
V.1.4	Infrastructure	84
V.1.5	State of Conservation of Resources	85
V.2	Project Description and Analysis	85
V.2.1	Master Plan	85
V.2.2	Protection	85
V.2.3	Research and Natural Resources Management	86
V.2.4	Environmental Education	87
V.2.5	Rural Ecodevelopment	87
V.3	Social Aspects	87
V.3.1	History and Distribution of Population	87
V.3.2	Production Systems	88
V.3.3	Strategy for Improved Resource Use	89
V.3.4	Community Involvement in Reserve Management	90
V.3.5	Increasing Agricultural Production	90
V.4	Institutional Aspects	91
V.4.1	Institutional Structure	91
V.4.2	Funding	92
V.4.3	Strengthening COREPASA	93
5	ANNEXES	95
5.1	List of People Interviewed During the Evaluation	95
5.2	List of Institutions Referred to in the Text of the Evaluation	97
5.3	List of Selected References	100

List of Figures

	after page
Wildlands and Human Needs Project Involvement	26
General Project Characterization Chart	26

List of Maps

Gandoca, Costa Rica	26
Southeast Coast, Saint Lucia	43
Sierra de Manantlan, Mexico	58
Sian Ka'an, Mexico	69
Pacaya-Samiria, Peru	82

ACKNOWLEDGMENTS

We would like to thank Dennis Glick and Michael Wright of the World Wildlife Fund who briefed us about the Wildlands and Human Needs Program and assisted and supported us throughout our evaluation of it. Many others at WWF generously gave their time and insights, notably Jack Noble, Catherine Fuller, Curtis Freese, Natalie Waugh, and Gus Medina.

At each project site we visited we met with project personnel who enthusiastically helped us pursue our work. We especially thank the following people: at Gandoca: Jim Lynch, Alberto Salas, and Benson Robinson; at St. Lucia: Yves Renard and Allan Smith; at Manantlan: Rafael Guzman and Eduardo Santana; at Sian Ka'an: Arturo Lopez, Enrique Dune and Marcela Alvarado; at Pacaya-Samiria: Roberto Rojas and Luis Moya.

After the field work was finished we made two presentations of our evaluation, one to World Wildlife Fund staff and the Advisory Committee to the Wildlands and Human Needs Program, and one to officers of USAID. In each instance the participants at the presentations entered into vigorous discussion of the Program which aided us greatly in shaping our evaluation report. We thank all the participants.

Finally, we thank our typists, Constance Barnes and Tannis Smith from Ingrid's Temps, without whose assistance the final report would never have emerged.

FOREWORD

This report represents the results of the evaluation of World Wildlife Fund's Wildlands and Human Needs Program. The Program, which began field work nearly two years ago constitutes a joint effort between WWF and the United States Agency for International Development which supports the Program with a grant that WWF matches.

The Program relates development to conservation in developing countries. It holds that economic development which benefits people who live in and near protected areas will further the conservation objectives of the protected areas. Toward that end, the Program designs and implements projects that include both conservation and development elements.

So far, fifteen projects, in Latin America and Africa, have started up within the Program. The Program intends to expand into Asia and to continue growing in Latin America and Africa. It also integrates into other programs at WWF, both longstanding and newly incorporated.

This evaluation is based on site visits to five of the Latin America projects by a team of two evaluators. These five sites, which represent the variety of projects included in the program, included: the Sierra de Manantlan and Sian Ka'an Biosphere Reserves in Mexico, the Gandoca Integrated Land Use Project in Costa Rica, the Southeast Coast Project in Saint Lucia and the Pacaya-Samiria National Reserve in Peru. One evaluator concentrated on physical and technical aspects of the projects and project sites; the other looked into social aspects and institutional arrangements. Additionally the evaluators interviewed numerous members of WWF management and staff in Washington as well as several people outside the organization who knew about the Program. The evaluation began in early July, 1987 and was completed in late September, representing an effort of about 45 days by each evaluator.

This report contains descriptions and observations from each site visited and a commentary on the entire Program.

WILDLANDS AND HUMAN NEEDS:
A PROGRAM EVALUATION

1 OVERVIEW

1.1 Theme

The fundamental premise of the Wildlands and Human Needs Program holds that the conservation objectives of protected areas in developing countries can be attained through development by local populations of the renewable natural resources in and near the protected areas.

This premise arises from the following general observations about protected areas in developing countries:

- o conservation of habitat constitutes the general means to specific conservation goals like protecting a particular endangered species or maintaining biological diversity.
- o the habitat requiring conservation also provides resources and benefits to local people.
- o current methods of resource harvesting by local people in the habitat may not be compatible with conservation but compatible methods can often by designed.
- o traditional methods of conservation by strict preservation cut local people off from their resources without providing compensation or alternate resources.
- o assertion of governmental authority frequently fails to secure protection.

In the worst cases, attempts at preservation that deny people access to resources result in degradation of the resources for development as well as for conservation.

Unification of conservation with development seeks to resolve conflicts and promote compatible uses. Local people should support conservation if they believe it maintains long term benefits to them. They want to continue to obtain food, fuel, building materials, medicines and products for sale from the habitat and they understand that loss or degradation of the habitat reduces its yield.

This means that if conservationists focus on sustainable development of natural resources they may indirectly attain better conservation than if they attempted conservation directly.

1.2 Objectives

1.2.1 Testing Assumptions:

The Wildlands and Human Needs Program tests the assumptions stated below by application in the field at several sites. The Program seeks to confirm the accurancy of the assumptions and learn whether they do advance the theme that development and conservation can interact to achieve compatible ends.

1.2.2. Selecting Sites:

The World Wildlife Fund has established criteria for selecting sites for inclusion in the Program and has applied these criteria to choose ten sites in Latin America. Each of the sites exhibits the following characteristics:

- an officially declared protected area;
- a peripheral zone that buffers the protected area;
- people living in the protected area or the peripheral zone who use natural resources from inside the protected area;
- a local NGO whose principal interest is conservation of the protected area and who believes that sound development of its natural resources by and for the people who use it will help conserve the protected area.
- government involvement in protection and management of the protected area.

1.2.3 Devising a Methodology:

WWF has focused on local NGOs as its principal nexus to each site. It offers the NGOs financial support, training, technical assistance, administrative and managerial expertise and, not least, the international stature and reputation of the World Wildlife Fund. WWF seeks to build a partnership with each NGO that strengthens it and makes it more self-sustaining. The NGOs use the support and resources they obtain from WWF directly and also pass them through to other NGOs, to consultants and to contract government services. Most of the NGOs have a "learning by doing" philosophy and, therefore, informal, on-site training predominates over formal training. WWF maintains close contact with each NGO by correspondence, field visits by its staff and by consultants and by inviting NGO personnel to Washington. For each site WWF also maintains relations through the local NGO and independently from it, with government agencies working at the site and with the headquarters offices of those agencies.

1.2.4 Accomplishing Development Projects:

Development at each site consists of using resources from the protected area or the peripheral area by the local people in ways that provide adequate income while maintaining the quality of the resources. Making development happen entails close interaction with local people to determine what stands between them and higher or more sustainable yields; i.e. identifying limiting factors to development. The next

step applies a solution that eliminates or resolves the limiting factor. Sometimes the solution is technical, and often entails action in the political and social areas as well. Once a solution is in place, it must be sustained. This means people must be convinced that it works and must be able to apply it or gain access to it themselves or by way of institutions they trust and participate in. Hence the significance of appropriate technology, training and institution building in success of the projects.

1.2.5 Attaining Conservation:

The ultimate goal of the World Wildlife Fund, conservation of the protected area, rests on support and collaboration of the local people. It also requires effective management by local and governmental institutions. When resource users and institutional interest groups act on the belief that conservation furthers their interests, they will do conservation. Periodic inventories of resources will show whether conservation occurs. Thus good baseline data are important and so are accurate, low cost techniques to survey resources.

1.3 Assumptions

The strategy of attaining conservation through development assumes several characteristics of the site and of the population of resource users:

- the site has high conservation value; it contains species or habitat of high scientific or social interest at the international level or of special interest locally.
- the site is subject to strong development pressure; local people, and possibly outside interests, currently use resources near, or even beyond, capacity or probably will use them so in the near future.
- the site exhibits high development opportunity; it has underutilized resources or resource use could improve.
- sufficient baseline data exist or can readily be obtained to determine the resource inventory and development capacity of the site.
- the local population engages in diverse economic activities; use of several resources, as opposed to dependence on a single resource, provides flexibility, spreads risk and increases receptivity to change.
- local people have secure rights to land and natural resources; people can make long-term investments in conservation because they feel secure in the likelihood that they will realize the benefits of the investments.
- a limiting factor prevents people from increasing or improving resource use; removal of the limiting factor will promote development, hence conservation.
- appropriate technology or institutional or social innovation can overcome the limiting factor; the

technology meets people needs and is within their means. Usually it will build on existing practices and skills and use local materials.

- local populations can make decisions and carry them out; they can assess their needs accurately and choose means to satisfy them that rely primarily on existing community resources.

1.4 Institutional Strategy

The strategy of attaining conservation through development recognizes that responsibility for conservation lies primarily with government, whereas use of natural resources rests largely on private initiative. The two often are not inherently incompatible but fail to occur harmoniously for lack of communication, conflicting goals, wrong incentives and other reasons. In recent years in many developing countries, especially in Latin America, governments have become more aware of their shortcomings in achieving sound natural resource management. At the same time these governments acknowledge how important and urgent sound resource use has become. Simultaneously, public interest in conservation has increased. This has given rise to numerous nongovernmental organizations who advocate conservation. Many of these NGOs make the connection between development and conservation and some of them carry out development projects in the field. The Wildlands and Human Needs Program links directly to these trends. It assumes that the following institutional features enable conservation and development:

- a local NGO occupies a strategic role with regard to conservation of a specific site; this NGO understands both the development and the conservation aspects of the site and relates well to the local populations using resources on and near the site.
- dedicated personnel staff the local NGO; they have a sense of vision about the value and potential of the site and determination to realize them.
- the local NGO can provide technical assistance for conservation and development from its own staff or by liason with other organizations.
- the local NGO trains its own staff and local people informally. It can also obtain access to formal training.
- the local NGO can allocate financial support for conservation and development of the site from its own resources and from resources it attracts from outside.
- the local NGO can not do this work alone; certain essential aspects of conservation, official designation of protected areas or formal title to land, for example, must come from government. Additionally presence of government in the management of the site lends permanence and stature to the conservation effort.

2 RELATION OF THE WILDLANDS AND HUMAN NEEDS PROGRAM TO OTHER WORLD WILDLIFE FUND ACTIVITIES

2.1 Historical Perspective

The World Wildlife Fund has worked in the field of conservation for more than a quarter of a century. Its initial focus concentrated on saving endangered species directly. It learned the biology of these species, advocated and established reserves for them, and campaigned against commercial use of their products.

These efforts succeeded. Today nearly every country has reserves for its endangered wildlife. Most people know about conservation and support it and trade in endangered species has decreased.

The initial success has led to new challenges. Very early WWF made the connection between loss of habitat and endangerment to species. That underlay its campaign to establish protected areas. But soon it became apparent that it took more than simply establishing reserves to make them work. They had to be administered and that takes trained staff, equipment, political support and money.

WWF turned its attention to these problems and again met with success in solving them. However, a more intractable difficulty gradually showed itself. This difficulty related to people living in and around reserves. The people hunted and fished in the reserves, cut down forests in them to make farms, mined their mineral and timber resources. They were excluded from decision making about the reserves and sometimes they were hostile to them.

The solution appears to lie with development for the people who obtain their livelihoods from the resources in the reserves. That idea gave rise to the Wildlands and Human Needs Program.

2.2 Current Situation and Future Trends

The Wildlands and Human Needs Program fits into a central position in the matrix of World Wildlife Fund activities. WWF organizes itself along both regional and programatic lines. Until now most of the projects performed under the Program have taken placed in Latin America. But WWF has made several advances toward Africa and Asia under the Program. Some incipient projects are underway in several Asian and African countries and WWF intends full- scale operations for the Program on both those continents.

The Program interacts well with the other parts of WWF's Latin America division. Latin America staff specializing in biology, education and non-governmental organizations all

know about the Program. Several of them have visited some of the projects and contributed expertise to them. Decision making about specific projects and project components in the Program involves these people.

As the program gathers momentum in Asia and Africa, similar involvement of WWF regional staff for those regions can be expected.

Senior management at World Wildlife Fund fully concur in and support the concepts and methods of the Wildlands and Human Needs Program. They keep abreast of progress in the program and make sure it receives adequate funding and staff.

A new development at WWF, through the Conservation Foundation with which it merged about two years ago, is the establishment of the Osborn Center for Conservation and Development. The Center will draw on expertise from both its parent organizations. Its very name, and the fact of its formation at this point in the history of the two organizations, indicate a trend at World WIldlife Fund toward choosing economic development as one path to conservation in developing countries.

2.3 Level of World Wildlife Fund Involvement

The Wildlands and Human Needs Program represents a large, long term commitment by WWF.

Financial support is the most obvious and pressing need for the projects included in the Program. When WWF responds to financial need, however, it's commitment goes far beyond simply providing money. By providing money, WWF becomes involved in the whole project and shares responsibility for it.

WWF shares in technical design of project activities. It provides some expertise from its regular staff and it also hires consultants for technical assistance. WWF shares coordination of the project. Directly, and through affiliated organizations and the organization that implements each project, it deals with national and local governments.

WWF also shares management of the projects. It becomes involved in planning and in administration. Most important, it shares leadership. Its presence signifies sponsorship, belief in the project and belief in the people who run it. WWF must help establish vision and long term goals.

All of this means that WWF has committed large amounts of staff expertise at several levels, and large amounts of time. Most of the existing projects are in their infancy. It will take several years to bring them to maturity. Even then continued involvement from WWF is probably advisable. A

new project needs injections of money for equipment, capital improvements, initial staff. A more mature project may require less money but it often needs well targeted technical assistance and training. A fully mature project can still benefit from a management partnership with WWF as it sets new goals and refines earlier accomplishments.

3 EVALUATING THE WILDLANDS AND HUMAN NEEDS PROGRAM

3.1 Program Achievements and Constraints

The Wildlands and Human Needs Program is still very young; it was started less than two years ago, and actual funding to its projects arrived in the field later; thus, most of the projects funded through the Program are just initiating operations. Moreover, the Program, and the projects funded by it, are tackling old problems with a new approach, namely facing development challenges with development efforts in support of conservation objectives. This new approach, although often talked about, has been seldom experienced in the field as this Program is attempting to do; this approach is new not only to the WWF, but to the project implementors themselves and to the institutional context that surrounds them as well.

These two facts are very relevant to the task of evaluating the Program's development so far. This evaluation has focused, not so much on the projects' physical outputs, but rather on trends and patterns that, being present at the project level, provide insights as to the way the program is working and principal needs that must be taken care of in order to facilitate its development in the future.

Under these circumstances, a number of program areas have been identified as principal categories in which to assess its performance. Those categories include institutional, social, technological, management and legal aspects, in most of which the program is testing new strategies and approaches.

3.1.1 Institutional Aspects:

In this field, the Wildlands and Human Needs Program has scored some of its greatest accomplishments. Through the implementation of the field projects, new local institutions are being built, and existing organizations are being strengthened. While the needs that justify the projects' existence had been evident before, the Program has acted as a catalyst, facilitating or initiating action toward the solution of identified problems.

Program funding has not only permitted several activities to take place, but has triggered the commitment of local support to the projects. The local support comes close to attaining the amounts programed for it, due in part to the pressure of being a counterpart to international funding.

While the value of external funding tends to be a common feature in most overseas projects, it has particular importance in this case because of the kind of activities that the Program covers. Most other funding sources --

external and local-- tend to either cover the "development" field (production, credit, infrastructure, etc.) or the "conservation" field (protected areas' management, species and habitat preservation, etc.). The Wildlands and Human Needs Program in contrast, has been willing to accept proposals that entail activities in both fields, sometimes at the expense of what could be called "excellence" in either one of the two traditional fields. By opening up to those innovative proposals, the Program has filled a great gap in development and conservation funding, and has become a most appreciated source of support for non-traditional projects.

On the other hand, the dependability of the Program in terms of continued funding is also crucially important to all field projects. This is so, in part, because of the somewhat specialized nature of the Program's concern, which funds an area that not many other organizations are supporting, and, in part, because of the long maturation period that most project activities entail. In this respect, the WWF's policy of annual budgeting constitutes a significant obstacle to smooth project operation. In the first place, the annual project review and reception of new proposals introduces an element of uncertainty that may preclude initiation of activities that require sustained investment; in the second place, writing and negotiating proposals once a year tends to involve great staff time commitment from these normally understaffed projects.

A related issue that also conflicts with established policy at WWF is the denial of overhead costs to implementing organizations. The latter tend to be non-governmental entities that can not count on stable financial sources. Program funding restricted to specified activities often creates a situation in which a given project staff enjoys dependable income and appropriate logistic support while other projects, and even the organization's management, are deprived of those. This situation tends to push recipient organizations into inefficient use of project funds, as available logistic support tends to be utilized by all field projects. Even very limited overhead funds would probably satisfy the same needs, improving the donor's image and avoiding inappropriate fund manipulation by the donee.

A word must be said about the organizations that have received funding by the Program, mostly non-governmental; the ones reviewed for this evaluation are staffed by competent and committed people who manage the projects efficiently and effectively. In practically all cases, these NGOs have been able to achieve a high degree of coordination with local governmental and non-governmental entities, thus enhancing the reach and impact of project activities.

A final remark is needed regarding the nexus between the Program and the field projects. All projects' staff have

expressed their deep appreciation for the prompt, flexible and efficient support of WWF's staff. It has been apparent, however, that the flow of information between the two is not optimal. Project reports tend to focus on assessing progress toward the fulfillment of physical objectives and on financial matters. Not enough is being analyzed, written and discussed about the underlying achievements and problems the projects are facing in tackling the Program's main objective, namely, the reconciliation of development and conservation needs in the field.

In fact, there is no explicit strategy in place to promote, record and channel the projects' learning on the specific strategies being tried at each site. In order to derive generalizations, concepts, and policy guidelines in the Program's area of concern, additional efforts must be made to provide the projects with a conceptual framework to work with, improved communication channels with the Program, and cross-fertilization opportunities with each other.

3.1.2 Social Aspects:

The Program's greatest success in this field is its popularity among the communities affected by or participating in it, which, in turn, is directly related to its choice of tackling issues and problems that are perceived by those communities as being vitally important for their survival or well being. Each project housed under the Program has started by addressing some problem seen as a great obstacle to rational resource management; one that coincides with the communities' perception of it as a critical need.

Thus the great acceptance of the Gandoca project, because it is trying to solve a land titling problem; or the St. Lucia project that tries to facilitate commercialization of the fishermen's catch, or create new income sources through its sea moss growing project and through its alternative charcoal producing plantations. The same is true for the other projects where new agricultural and forestry opportunities are being sought to compensate the communities for their loss of access to reserve resources. Most of these problems would have been there even if the reserves had not been created, and often constitute typical community development problems. By attempting their solution or amelioration, the projects are making a greatly appreciated contribution to those groups. In return, the latter tend to be willing to collaborate with the projects' efforts or at least to consider the resources management proposals it may put forward.

To the extent that these projects manage to put certain resources at the communities' reach, and foster local, regulated administration of those, the projects would receive strong and sustainted support from the communities. While

most field projects profess their committment to facilitating community participation in resource management, most of them fall short from truly practicing it. So far, most projects have translated community participation into community "education", meaning the elaboration and transference of messages to their publics. When direct resource utilization is being fostered, the resources chosen for the purpose tend to be other than the ones protected by the reserve, showing lack of confidence in the communities' ability to comply with a conservation and rational management role within the reserved area, and lack of preparedness to confront the institutional responsibilities that would come with that.

In general, most community activities in the field projects are in hands of staff trained in other fields, mostly biology, not in the social sciences. Thus the projects become a first, and often unguided, experience for those professionals into the realm of community organization and resource administration for income production purposes. This situation results in the project taking a number of unnecessary risks --inadequate planning, lack of marketing studies, out-of-hand growth of certain productive sectors, etc. Clearly these are not the traditional conservation projects that can be managed by ecologists and biologists alone; they are rather multisectoral projects where participation from professionals of varied disciplines is needed. In the cases reviewed, the need for professionals trained in sociology, anthropology, economics and marketing was particularly evident.

It is apparent that this area will need additional work from the Program and its projects in order to create real, participatory community programs. The Program must spend time developing the idea and methodology with project staff, and the latter would have to identify and develop adequate technologies to put those methods in practice.

On the other hand, the educational function so clearly favored by all field projects, is also in need of additional support, since the projects tend to lack staff specifically trained for the purpose. While projects' accomplishments so far have been impressive, their needs in this area are far from satisfied. Other local (national) organizations could perform a significant role in this respect.

In summary, although the program has gone a long way at recognizing that the obstacles to adequate resource management and conservation are social and political, not only technical, it still has to develop a set of strategies, methods, techniques and tools to cope with the challenges the chosen path presents.

3.1.3 Technological Aspects:

By focusing on the solution of basic community problems (like land tenure, agricultural productivity, etc.) most field projects are not engaged in developing new resource management technologies; rather, they are paving the way for old solutions to work effectively to solve identified problems (land surveying, credit provision, pest control, etc).

Those projects that are involved in facilitating direct community responsibility for reserved resources management (St. Lucia, Gandoca) are the ones who face the need to come up with viable alternatives to traditional resource use patterns. These cases need all available support to develop sound strategies and appropriate testing methods before those are implemented in the field. Additional information from other experiences around the world would also be a well received input to the task.

In general this aspect of the Program is in its initial stage; for it to be developed adequately, a concerted effort must be made to provide the projects with expert advice and cross-fertilization opportunities among participating projects. Discussion of these points by project follows on the next chapter of this report.

3.1.4 Reserved Areas Management Aspects:

It is important to note that, while there is a strong resource management component in all these projects, the reserved area management objective is not necessarily central to all of them, and in some it is only lateral to the project's main focus.

The projects with a strong protected area component are Pacaya-Samiria in Peru, Sian Ka'an in Mexico, and Sierra de Manantlan, also in Mexico. Only in the first of these three does the project's implementing institution have the leading role in the reserve's administration, while in the other cases, the recipient organization is limited to a support function.

In the other projects the reserved areas' management component holds a less prominent character. The Gandoca-Manzanillo Wildlife Reserve in Costa Rica is not a reality yet, and may never be so as a Reserve is conventionally thought of, but may rather become a special use zone under private ownership. The St. Lucia project focuses on continental resource management and utilization in the buffer zone around the Maria Islands, rather than in administration of the Maria Islands Reserve.

For the projects that are closely related to reserved area management, Program funds have gone mostly to the writing of management plans, and are expected to continue

supporting the plans' implementation in the future.

Since the value of these plans will only be tested in the future, in so far as they are able to contribute effectively to the reserved areas' conservation, this evaluation restricts itself to stating that the quality of the contents of those reviewed --Manantlan's and Pacaya-Samiria's-- is commendable. Additionally, it is important to emphasize the value of having had those plans conceived and written by local experts and local institutions, the same ones who will implement them in the future. The implementors' participation in the design of the plans will surely enhance their commitment to the task.

3.1.5 Legal Aspects:

Every single one of the projects visited faced one main legal constraint, namely, restriction under national legislation of resource utilization by local communities inside reserved areas. Those restrictions affect the Gandoca project's effort at providing farmers with titles over the land that has been made into a Reserve but that was promised to them as part of the project's whole idea; the Pacaya-Samiria project is encountering the same obstacle in its effort to promote alternative productive activities, particularly agriculture, within the reserve via credit, as no credit is given without legal land title. Exactly the same problem affects the other projects.

It is clear that national legislation has not evolved yet in the direction of enpowering local communities as rational resource managers; such legislation continues to conceive the areas' protection as a function of its isolation from human intervention.

All projects are working on the assumption that, when really confronted with the problem, some bypass will be found to overcome the obstacle. Not one of them is tackling this problem at its root. Although it seems unreasonable to charge the field projects with responsibility for changing the spirit and letter of their countries' legislation, it also seems risky to continue operations without paying adequate attention to this fact. It is the evaluators' contention that this obstacle will prove itself a most significant handicap that may threaten the projects' ability to comply with their final objectives.

There is great need for a concerted effort to cope with this problem. Regional and international agencies may find here a field for an innovative and most needed contribution.

In summary, the Wildlands and Human Needs Program holds great promise for effectively tackling some of the most challenging problems faced in conservation, resource

management and community development by active participation. Particularly given its innovative nature, it faces both risks and opportunities. However, the Program's potential benefits outweight its costs, part of which are to gradually develop new methods and approaches to the problems found in its way. The recommendations that are included in this report are aimed at providing an outsider's view of alternative ways to cope with those obstacles. Hopefully those recommendations would serve the purpose.

3.2 Program Management

WWF manages the Wildlands and Human Needs Program from its headquarters in Washington, D.C. One person has responsibility for coordinating the entire Program as well as performing additional duties. He receives assistance from several other people on the technical and managerial staff, however, so that, in reality, program management operates by a team approach. This system seems to work well. The various staff members appear to respect each other and collaborate informally and voluntarily as well as through a Program committee.

As the Program increases in size and complexity, staff time required for management will increase. Although the team approach should continue as the principal management mode, it may become necessary to assign more people to the Program full time.

The Program committee of WWF staff decides which field projects to support and what type and level of support to accord them. This pattern mirrors the overall system of proposal, review, possible modification, and approval which WWF applies to all the projects it supports.

The Program receives advice from an advisory committee. Representatives of about a dozen NGOs, some involved in development and some involved in conservation, compose the committee. The committee meets periodically to advise WWF on technical matters and also make suggestions about management and programming.

Most interaction between WWF and USAID with regard to the program also occurs in Washington as the program receives funds from AID's Washington Bureau of Food for Peace and Voluntary Assistance. AID Mission officials in the field know about the project, however. WWF staff members make a point of informing people at the Missions when they visit project sites. Usually there are one or two key people in a Mission who keep abreast of the Program. In general the Missions seem to view the Program as parallel to but not directly connected to their own development assistance projects. The Peru Mission may become one of the first to incorporate Program activites more fully into its

portfolio. The Agricultural Development Office in Peru plans to prepare a national natural resource management strategy with an eye toward including it in the Country Development Strategy Statement. The national strategy on natural resources will certainly make reference to the Program's project at Pacaya-Samiria as both a successful effort in natural resources management and a good example of AID collaboration with NGOs.

Program management communicates with the field in a variety of ways: telephone, written correspondence, visits from field personnel to Washington, and visits by WWF staff to the field. The personal visits provide the most valuable communicaiton, by far. It is important for technical and management people in the field in developing countries to know what WWF is like, who works there, how capable they are, the conditions they work under. The same goes for WWF staff. They can only know how things work in the field by going there themselves, looking, asking questions, comparing with other experiences they have had.

Each of the five field projects visited during the evaluation had had recent visits from WWF staff. Field personnel knew one or several contacts at WWF personally. They appeared to feel that they had ample access to those people and could call on them when they felt they ought to.

Additionally, several of the field projects had had contact, often extensively, with consultants provided by WWF. In each instance, the relationship appeared good. Field staff spoke highly of the consultants and the work they had shared. WWF seems to choose its consultants wisely and supervise them adequately.

3.3 Program Funds Application

This section reviews the general budget lines to which Program funds are devoted. The table below shows each one of the projects visited, against the several items to which funding is devoted. To show similarities and differences among them better, the distribution of expenditures is shown on a percentage basis. The figures used to calculate these percentages were the first year project budgets, which were chosen because such information was available for all projects, whereas the same was not true for the second year period. Reported expenditures and budgeted items tend to show only slight discrepancies, so that the relative importance of the various lines of costs remains true for both.

Program Funds Use Distribution

Items	Projects				
	GANDOCA	ST.LUCIA	MANANTLAN	SIAN KAAN	PACAYA-SAM.
Personnel:					
-pr.leader/s	28.6%	42.0%	---	32.1%	---
-other staff	8.4%	40.0%	35.6%	22.0%	20.8%
-tech.assist.	---	---	42.6%	---	16.2%
Travel:					
-internatl.	1.4%	3.0%	---	7.3%	---
-local	1.7%	4.0%	6.1%	18.6%	---
Materials:	3.3%	---	5.6%	4.3%	---
Prj.Activit:	51.5%	3.2%	10.0%	13.1%	36.4%
Operations:	4.4%	6.4%	---	2.1%	26.5%

Two observations are most relevant. The first is that a great deal of all project funds goes to cover salaries, particularly those of the project leader, except for the two projects where the leaders' salaries were covered as local counterpart contribution. The importance that leader salary expenses have for the other projects highlights the value of such counterpart. In two cases, other project staff salaries were a significant cost, while in one of them technical assistance took a great share of the total project budget.

The second observation is that, to some extent due to the magnitude of the salaries item, the project activities line looks like a minor share of three of the five projects budgets; this line seems to have very limited importance particularly in the projects where the salaries item is high.

It is noteworthy, then, that the Program is currently investing in keeping highly qualified people enlisted, even at the expense of having limited room for actual field activities. This arrangement may change in the future as the projects consolidate themselves and if implementing institutions enhance their ability to support project staff as their counterpart. By then, probably, Program funds could be applied more to field activities and less to cover operational costs.

The institutional analysis for each project shows that in two of the three cases where the salary item is very high in relation to the rest of the budget, the recipient

institution seems less prone to consolidation using local funding; in those cases, a reduction of the relative importance of this budget line would seem appropriate.

A final word goes to comment on the extremely low operation costs line --except at Pacaya-Samiria where river transportation brings those costs understandably high. This is probably so because of the peculiar institutional arrangement that surrounds these projects, where flexible, adaptable and small local institutions adopt a low cost operation strategy as part of their institutional philosophy, a rather common feature of non-governmental organizations' operation.

3.4 General Program Conclusions and Recommendations

1. The Wildlands and Human Needs Program has been evaluated at several levels: the role of the Program within the World Wildlife Fund, the structure and functions of the Program staff at Washington D.C., the nexus between the Program and the field projects, and finally the field projects themselves (although these were not subject to in-depth evaluations; rather, their connection to the Program and their ability to serve the overall Program objectives were being examined).

2. Within WWF, the Program has acquired great significance, as it is seen by the Funds' high-level officials as leading the way towards enhanced understanding of social and economic constraints and opportunities that pertain to the Fund's conservation objectives. Those socio-economic areas had long been identified as having great influence upon the Fund's ability to perform its intended functions; the WHNP is, for the first time, attempting to act towards and within those fields. The Program has raised expectations among the Fund's staff who are providing it with support on many fronts. It is clear that the Program's success is in the Fund's best interest, and that the institution is willing to do what is within its means in its support.

In order to satisfy the Fund's expectations, and enhance the Program's reach, every effort should be made to keep the rest of the institution well informed about the achievements and challenges faced by the Program. Disseminating information about the field projects would seem a possible means to improve the WWF staff's awareness of the Program. A short (one page) issue could be printed periodically, where one project would be reported on, including one or two pictures of the site, and emphasizing the project's findings as they concern the overall quest of the Wildlands and Human Needs Program. Those issues could be circulated beyond WWF, certainly to USAID, but to other organizations as well.

3. The Program as a whole and all its projects, in general, have derived themselves from the identification of a conservation need, and have been conceived and are being implemented by people with primarily an ecology, biology or resource management background. There is also a need for staff and project personnel with training and experience specifically in the social sciences, including economics and marketing, particularly at this point in project development where community work is being started. Central Program staff have already identified this as a need and are planning on hiring a social scientist in the near future. It would be important, though, to suggest and support the field projects in doing the same. There is a similar need in appropriate technology and small development projects generation.

4. The connection existing between the field projects and the Program in Washington consists today, on the one hand, of routine progress and financial reports and, on the other, on fruitful personal visitation of the Program staff to the field projects. From the point of view of the Program, however, the field projects are testing various strategies to cope with one single problem: the apparent conflict between conservation and development, and the need to solve it. Under current circumstances, however, not enough time is being devoted to the discussion of the projects' progress in this realm. Furthermore, it is possible that the projects are not looking at their own findings under such abstract terms, and therefore a significant part of the experience goes by unrecorded and unanalyzed.

Therefore, there is a great need to have the Program develop a tentative conceptual framework against which the projects can test the various strategies being tried, and which would allow the projects to see where they fit into the overall objectives the Program holds.

Besides developing and discussing such conceptual framework, the Program would need to develop the corresponding formats that would be used by the projects to report their tactics, methods and findings. Continued interaction between the Program and the field projects would ensure that, some time from now, clear theoretical and practical learnings can be derived from the projects and the whole Program experience.

5. Just as important as this fouth point, is the need to provide the field projects with cross-fertilization opportunities, which would allow them to learn from each other.

6. As concerns the field projects themselves, the addition of staff with training and background in social sciences, economics and marketing, and appropriate technology

development has already been mentioned. Complementing that recommendation, the combined analysis of ecological, social, technological and economic feasibility for in-project actions is also recommended. Appropriate methodology would have to be developed; this task should be part of the support function of the Program toward the field projects.

7. Finally, and as a concluding remark, continued funding for the Program is recommended, as it is clear from this evaluation that the Program is playing a vital role in the generation of new opportunities for both conservation and development to be achieved in the field. Beyond the field achievements, the Program promises to make significant contributions to our understanding of the challenges faced in these fields in the developing world, providing them insights that would be useful to other Programs and projects in the future.

4 EVALUATING FIELD PROJECTS WITHIN THE WILDLANDS AND HUMAN NEEDS PROGRAM

4.1 General Project Characterization and Achievements

Field projects are the central focus of the Wildlands and Human Needs Program. If the field projects succeed, the Program succeeds, otherwise it doesn't. The evaluation of the Program, therefore, concentrated on examining and evaluating field projects.*

World Wildlife Fund has selected ten sites where it has projects under the Wildlands and Human Needs Program and there are a number of others under review for inclusion in the Program. Each site satisfies most of the assumptions that apply to joining conservation with development. WWF has also connected itself with a functioning network of NGOs, usually one for each site, which share its viewpoint and goals. WWF support flows to each NGO and each project and WWF seems satisfied that the support is well used. In each instance the support is essential in that it sustains activities that would not take place without it, at least not as soon nor as completely.

WWF administers the projects effectively and efficiently. Program staff in Washington are well acquainted with the details of the sites, the development projects, the NGOs, and the collaborating government agencies. People on site at the projects have a good understanding of WWF's role and seem satisfied with the kind and quality of the support they receive. Each project exhibits substantial success in reaching the objectives set for it. Some notable examples for each of the five sites visted as part of the evaluation of the Program are set out in the following pages.

4.1.1 Gandoca, Costa Rica:

At Gandoca the principal achievement attained through WWF support entails institution building and structuring innovative institutional arrangements. ANAI, the organization promoting sustainable developemnt and providing technology and training for it, recognized that the main obstacle to development was not technical, but political and social. People needed secure title to their lands. But qualifying for title was beyond ANAI's capacity as well as out of reach of the ordinary farmer. Obtaining title required a long, expensive process with several government agencies operating from the national capital.

ANAI approached the problem in two ways. It hired a

*See: Terms of reference for the Evaluation of the Wildlands and Human Needs Project.

Costa Rican professional to coordinate the process of obtaining title for farmers in and near the Gandoca - Manzanillo National Wildlife Refuge. This man is knowledgable in Costa Rican land matters and is, himself, codirector of an NGO dedicated to sustainable rural development. ANAI also used some of the funds WWF had provided to the Gandoca project to enter into a contract with the government agency responsible for platting lands prior to titling. Under the contract ANAI financed the field costs of doing the platting and the agency provided the personnel to do the work.

The platting part of the titling process has nearly been completed. The farmers feel well informed about the process, are reasonably optimistic that eventually they will receive title, and have increased respect and good will toward ANAI.

4.1.2 Southeast Coast, Saint Lucia:

The ECNAMP project, working on the southeast coast of Saint Lucia, has successfully introduced a new technology for raising sea moss, the name given to several agar producing algae used locally for beverages. Harvesting sea moss is traditional in St. Lucia. People simply gather it from rocks in shallow coastal waters, dry it, and sell it in the towns where it brings US $10 per pound. But no one ever grew it until a marine biologist working for ECNAMP, with financial support from WWF, figured out how.

He has designed a simple raft made of locally available bamboo and inexpensive nylon rope that costs less than ten dollars to build. One person can build several rafts in a day. The nylon ropes support strands of sea moss that are woven into them by hand, a technique that someone without experience can quickly learn. The rafts are anchored in shallow water, tended occasionally for cleaning and filling in gaps amoung the strands of sea moss and harvested after about two months. Six to eight feet of nylon rope yield about one pound of dried product.

This technoogy succeeds because it has the right ingredients. It uses a raw material that has an existing, simpler technology. It produces a product for a known, reliable market. It can be mastered by and paid for by people who currently practice the simpler technology and it can readily be learned by newcomers to the trade. One man from Vieux Fort, St. Lucia began using the technology at a small scale. He liked it and decided to expand so he qualified for a short term loan and built about a hundred rafts. Four months later he was able to pay off the loan and now he has a successful small business.

4.1.3 Manantlan, Mexico:

The striking accomplishment at Manantlan consists of the mass of baseline data that Laboratorio Natural las Joyas has assembled for the site. The data cover all of the resources at the site and will include continuing measurements as well as initial inventories. The capacity to collect data stems from the Laboratorio's close association with the University of Guadalajara. Many of the Staff are professional research scientists from the University.

The Laboratorio's research capability fosters two other objectives of the project -- training and resource management. The Laboratorio views the site as a living laboratory where it teaches school children and university students. It plans to expand training to include informal teaching to local communities about resource management.

Resource management, the next big challenge for the Laboratorio, relies heavily on solid information. Having good baseline data will allow the Laboratorio to make better informed management choices. It will also enable monitoring to verify whether the management techniques produce the results expected of them.

4.1.4 Sian Ka'an, Mexico:

The lobster fishermen at Sian Ka'an catch lobsters with devices that look like small, short-legged tables. When these devices are set in shallow water, lobsters hide under them and the fishermen simply remove the lobsters that have hidden themselves. Traditionally the lobster fishermen have made their traps from chit, the local palm also used for construction and thatching. Each fisherman has dozens, even hundreds, of traps which require lots of chit to build. Chit has become locally scarce near the fishing villages, for building as well as for traps.

The fishermen have agreed with Amigos de Sian Ka'an, who uses funds from WWF to employ a botanist to study chit reproduction and growth rates, to test using other materials for their traps. During the two year trial period they will build the traps from inexpensive, locally available ferrocement instead of chit.

This demonstrates the proposition that resource users will conserve resources when practical alternatives exist. The users must see the merit of conservation and the alternative must make sense technically and economically.

4.1.5 Pacaya-Samiria, Peru:

In July of 1987, COREPASA, the committee of representative from all the official institutions working in the Pacaya-Samiria Reserve put on an educational event funded under collaborative agreement with WWF that it called the

mobile seminar. The mobile seminar consisted of two groups: an instructor group of university professors and senior natural resources professionals and a participant group of Reserve personnel and local school, health and police officials. A large river boat provided mobility for the 42 people in the seminar.

The group used the boat to visit eleven communities on the Ucayali and Maranon Rivers near the Reserve. At each community they showed films, gave talks, and held town meetings about the Reserve. The principal purpose of the meeting was to inform local people about the Reserve. But learning people's attitudes toward the Reserve and their expectations of it was an important secondary purpose. The seminar also provided direct teaching about the Reserve to the participant group on the boat by traveling through it and observing its resources and activities.

A few weeks after the seminar had passed, people in all the towns along the rivers were still talking about it. It had made an impact on them because it demonstrated the values the Reserve could hold for them and set them thinking about those values.

4.2 Constraints to Achieving Project Objectives

Observation of five project sites under the Wildlands and Human Needs Program provides a perspective from which to generalize about all projects in the program and the Program as a whole. Beyond noting individual successes and failures at specific projects, one can attempt to draw principles that tend to apply at all the sites. With regard to obstacles, or challenges to successful execution of projects, the five categories noted below merit discussion.

4.2.1 Credibility:

Success of each project rests on credibility. If people who should participate in the project don't believe in it they won't do it. That means the activities and practices proposed by the project have to work. They must function technically and they must be attainable by the project users. The users must have the skills to do them, the ability to purchase necessary materials, the time to perform them. The activities and practices must produce results. The results must compare favorably with those from former activities and practices and they must arrive fairly quickly.

The charcoal producers at Mankote, Saint Lucia need a dependable supply of quality wood. They can't wait too long for the leucaena plantation to produce.

Credibility attaches to organizations as well as to activities and the individuals who promote them. When an

organization makes a promise, its reputation rises or falls an its ability to meet the promise. At Gandoca, for example, people rely on ANAI, and its staff and associates, to deliver land titles. If the farmers have title within a year or so, ANAI's standing in the community will increase greatly. But, if the title effort drags on too long, or fails altogether, ANAI's credibility will be damaged and its ability to perform other aspects of the project will suffer.

The credibility chain reaches beyond each site and implementing organization to the World Wildlife Fund itself. So long as WWF makes mostly wise choices it maintains its credibility. But, numerous mistakes could become costly. WWF must continue to choose sites, projects, and collaborating organizations with great care.

4.2.2 Innovation:

Most of the projects under the Program entail high levels of innovation. The innovation may be technical: new tree crops at Gandoca; sea moss rafts in St. Lucia; alternate materials for lobster traps at Sian Ka'an. It may be institutional: contracts between ANAI and the government office of Plats at Gandoca; the longstanding relationship between ECNAMP and the St. Lucia National Trust; the whole idea of a "natural laboratory" at Manantlan; the unique assembly of management and technical experts from several government agencies that have come together to form COREPASA at Pacaya-Samiria. It may be social: voluntary restrictions of fishing in Saint Lucia and Sian Ka'an.

Whatever the innovation it shares the advantages and drawbacks of any innovation. Being new, it is unproven; it goes against tradition; it engenders skepticism and resistance; it requires change, often expense. On the other hand, it sparks enthusiasm and holds promise.

Innovation done well gains acceptance and approval. An innovation that works can spread rapidly and improve people's lives. In a sense, innovation is the essence of development. Success depends on introducing practical innovation through functional channels. Successful innovation enhances credibility. Failure leads to rejection of the innovation and loss of credibility.

4.2.3 Risk:

The need to attain and maintain credibility and the innovative nature of the projects, added together, result in high risk. Other factors, such as the basic quality of the site and its resources and social attitudes increase or decrease risk. In general, the sites are complex and their ecology is not fully understood thus increasing the risk.

WWF needs to evaluate the risk factors at each project and prospective project. High conservation value of a site may justify taking more risk. Good development potential will reduce risk.

Project actions should aim at reducing risk by resolving obvious problems, especially those arising from public ignorance of the project. Education components in projects can build public support and reduce risk.

4.2.4 Transferability:

Transferability is often an explicit goal of development projects. If a project succeeds it makes sense to transfer it to another place so it can succeed there also. But attempted transfers often fail to meet expectations. The new site differs from the successful site, sometimes obviously, sometimes subtly.

Failure often accompanies attempts at direct transfer of specific technologies or institutional mechanisms. This occurs because each specific success takes place in a specific context. The success turns to failure when attempted out of context.

Elucidating the principles that underline a particular success improves transferability. These principles will transfer more broadly than a particular technique will. Take the storage and marketing buildings at Savannes Bay, St. Lucia, a clear success, as an example. The success at Savannes Bay does not mean that storage and marketing building should be set up in fishing communities throughout the Caribbean. What it means is that community involvement in finding and eliminating a limiting factor to development can work.

This principle should work in other places also, where its application will lead to specific development activities that might be very different from the one at Savannes Bay.

4.2.5 Management:

Overcoming the constraints noted above will require high levels of management. Project success depends on wise choices which rest on solid planning using accurate information.

Complexity of the projects and the need to involve communities requires good coordination. Coordination must extend beyond the project to local government and national government agencies.

Project success also depends on capable administration. To do any administrative task poorly --

bookkeeping, purchasing, personnel-- reduces project efficiency and distracts its focus.

Projects rely on leadership. Some person or small group of persons must provide vision for the project and take charge of setting its basic goals and style of operation.

The need for management at the project level reaches to the program level. WWF must practice good managment of the Program to maintain efficiency and set an example for the projects. The concept comes full circle as WWF participates in managing the actual projects.

4.3 Field Evaluation of Five Projects

The results of visits to each of five field projects are set out in detail below. As introduction to the detailed project evaluations, the next few pages contain two tables. The first table states the specific activities, events, and purchases that World Wildlife Fund has made under the Program at each project. None of the projects depends entirely on WWF for funding; in some instances WWF provides a relatively small fraction of total project funds. Furthermore, none of the projects began as part of the Wildlands and Human Needs Program; in each instance an existing project was up and running and applied to WWF to expand its activities with additional financing.

The detailed project descriptions which follow refer to the whole project, including activities funded from sources other than WWF. Where appropriate, the descriptions note specific WWF support.

The second table rates each project against a set of criteria designed to provide a quick generalization of project characteristics, value, etc. The ratings given represent the subjective view of the evaluators after seeing the projects and talking to people who implement them and benefit from them. This table should not be read as approving or disapproving of a particular project. Rather, it serves as a tool to compare projects and consider future projects.

WILDLANDS AND HUMAN NEEDS PROJECT INVOLVEMENT

Site	Activities Supported	Management Style	level WWF/AID Support
Manantlan Biosphere Reserve, Mexico	Financial and technical support has been provided for the development of the reserve operational plan. Current funding is directed at implementing this plan and includes salaries and project costs related to education, extension and investigation.	A wildland management consultant supported by WWF has provided periodic technical assistance. Salaries of several project staff were also provided. The wildland specialist has served as WWF technical advisor and headquarters staff have also visited the site.	$24,300 FY87
Sian Kaan Biophere Reserve, Mexico	Financial assistance has been provided for four ecodevelopment projects; the El Ramonal Experimental Farm, the Spiney Lobster Management Project, the Palm Utilization Study, and the Nature Tourism Program	Funding has supported staff salaries, training and project equipment. Headquarters staff have made several site visits.	$36,000 FY87 $45,700 FY88
Southeast Coast Project, St. Lucia	Funding has supported several small-scale conservation development projects including sea egg cultivation, firewood plantations, fishermen coop organization, environmental education and wildlife reserve management	Funds have paid for project staff salaries and equipment. A portion of the technical advisor's salary is also provided. WWF headquarters staff periodically visit the project.	$47,800 FY86 $48,000 FY87
Gandoca Integrated Development Project, Costa Rica	Funds have supported the land titling process (mapping, aerial photos, photo interpretation, legal work, ground, truthing ect). Funds have also facilitated the drafting of an operational plan for the reserve and the training of the reserve director.	Salaries of project staff are partially paid by WWF. All project personnel are nationals or expatriot residents. WWF headquarters staff visit the project twice a year.	$47,000 FY86 $60,000 FY87

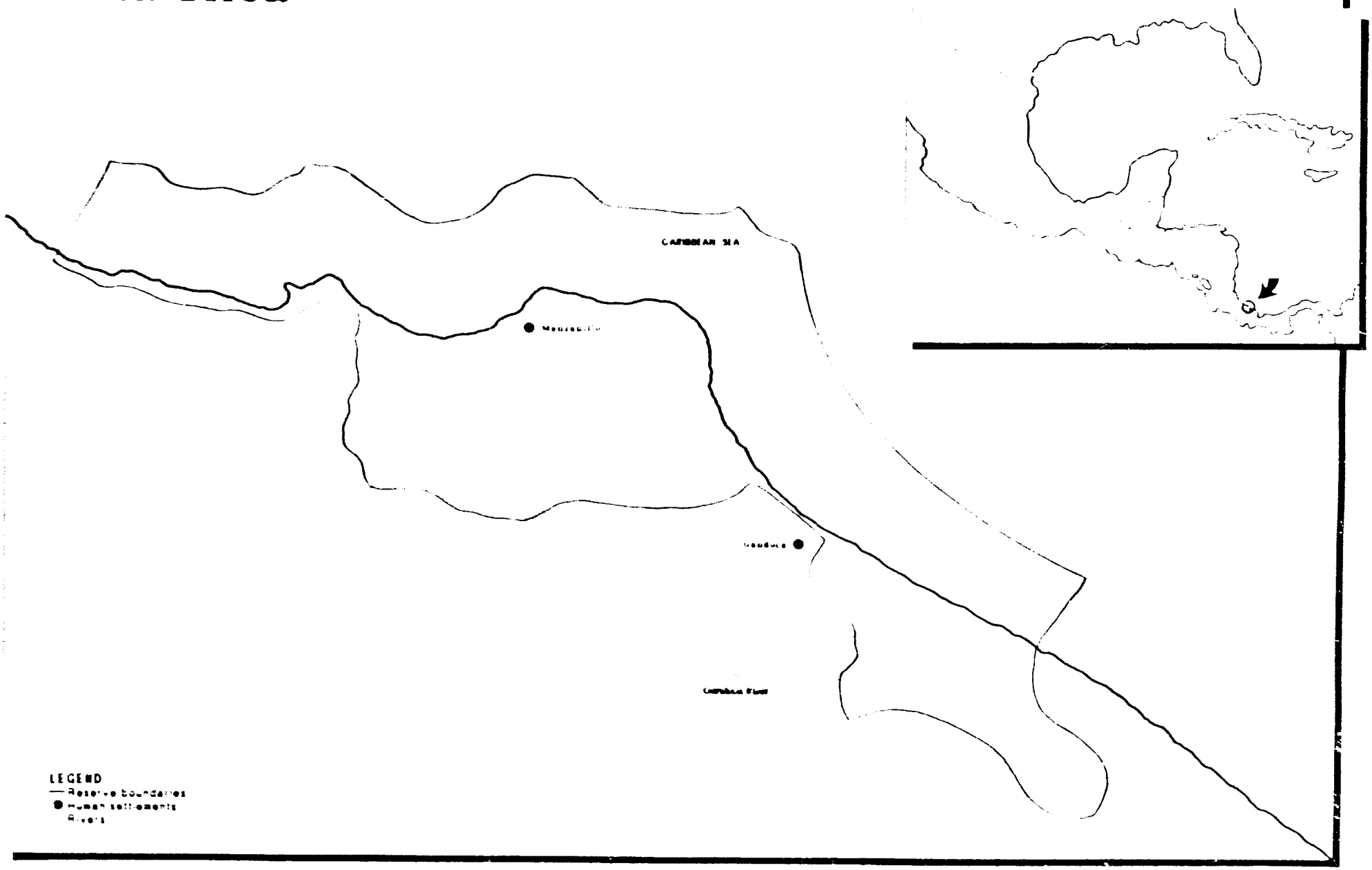
Pacaya Samiria National Reserve, Peru	WWF has provided technical and financial assistance for the development and implementation of the reserve operational plan. This has included funding for a wildland planning consultant, staff salaries for reserve personnel, equipment, investigations, educational materials, and construction of infrastructure.	The wildland planning consultant supported by WWF has spent several months at the reserve assisting in the planning and management process and in training reserve staff. WWF headquarters staff have made three trips to the project.	$2,500 FY87 $49,500 FY86

266

General Project Characterization

	Gandoca	St. Lucia	Manantlan	Sian Ka'an	Pacaya Sam.
International Conservation Value	low	medium	high	high	high
Local Conservation Value	high	high	medium	medium	high
Development Pressure	high	high	high	medium	medium
Development Opportunity	medium	high	medium	medium	medium
Baseline Data Availability	low	medium	high	medium	low
Land and Resource Security	low	medium	medium	high	medium
Diversified Economic Activities	high	high	high	medium	medium
Presence of a Limiting Factor	high	high	medium	high	medium
Appropriate Technology/Social Innovation	high	high	medium	medium	medium
Local Decision Making	high	high	medium	high	medium
Institutional Innovation	medium	low	high	high	high
Strategic NGO	high	high	high	high	high
Dedicated Personnel	high	high	high	high	high
Technical Assistance	medium	high	medium	medium	medium
Informal Training	high	high	medium	medium	medium
Formal Training	medium	medium	high	low	medium
Financial Support	low	medium	high	low	low
Coordination with Government	high	medium	medium	low	low
Essential Governmental Action	high	medium	medium	medium	high
Credibility	medium	high	medium	medium	medium
Innovation	medium	medium	high	high	medium
Transferability	medium	medium	medium	medium	medium
Risk Involved in Project Activity	high	medium	high	medium	high
Management Capacity	high	medium	high	medium	medium
Level of WWF Involvment	high	medium	high	high	high

Gandoca Integrated Development Project
Costa Rica



I. GANDOCA, COSTA RICA

I.1 Site Description

I.1.1 General:

The Gandoca Project is located on the Atlantic coast of Costa Rica adjacent to the border with Panama. The site contains ocean, coral reefs, beaches, coastal plain, river terraces, interior uplands, several rivers and streams, a large fresh water swamp and a small area of mangrove. Ecologically, the site falls in the tropical moist forest life zone. It receives approximately 2500 mm of rainfall annually.

I.1.2 Land Use:

On the best alluvial lands along the Sixaola River, large companies grow bananas for international commerce. Small farmers occupy the next best lands on river terraces where they grow a mixture of annual and permanent crops for mostly domestic markets. They farm intensively on parcels that average less than ten hectares in size and keep some livestock, primarily pigs and chickens, rather than cattle.

The uplands support a sparser population engaged in a mixture of permanent and annual crop production and low intensity livestock production. These lands used to contain extensive, commercial cacao plantations. The plantations were abandoned quite a few years ago and the land settled by small farmers whose holdings range from 30 to more than 100 hectares. Cacao remains their principal commercial crop. Much of these lands remain forested, though the best timber has been removed from them. The forests continue to yield firewood, poles and posts, roofing material and some timber. These lands also support wildlife, though the preferred food species - deer, wild pigs, tapir - have been hunted out and the large predator cats have disappeared. The remaining wildlife includes several species of monkey, rodents, opossum, small predators and numerous types of bats, birds, reptiles and insects.

The coastal plain supports small-scale production of cacao and coconuts, mixed subsistence farming, low intensity livestock raising, and some harvest of forest products and wildlife.

The mangrove contains a very attractive lagoon that people come to for fishing and recreation. It also supports a population of caimans. Currently, little tree cutting occurs in the mangrove nor do human activities interfere much with the flow of fresh water and sea water within it. The small size of the mangrove - about 250 hectares - makes it

vulnerable, however.

The fresh water swamp contains an interesting mix of plants and animals not found elsewhere on the site that have not incurred too much disturbance from human activities. A valuable timber tree, cativo, occurs in the swamp in large numbers and pressure exists to exploit this resource. Cutting the cativo would seriously alter the swamp and reduce its capacity to support wildlife.

The beach supports coconut growing, residential and recreational uses, and some fishing. In some places, most notably at the town of Manzanillo, the beach has suffered severe erosion in recent years. Loss of the beach to erosion has toppled coconut trees and even houses.

The coral reefs protect the beaches and provide breeding and feeding grounds for fish, shellfish and crustaceans, of which spiny lobsters are important commercially. In the last few years the reefs have partially died and continue to deteriorate rapidly. The phenomenon appeared first at Cahuita, north of the site, and has spread south. The beach erosion at Manzanillo appears to relate directly to poor health of its protective reef. Technicians associated with the project attribute reef deterioration to sediments carried by the Sixaola and Estrella Rivers. Chemicals associated with commercial banana growing along these rivers appear in water samples taken at the reefs.

The ocean provides fish for commerce and subsistence. Some residents of the site gain their living primarily from fishing; most of the others fish for recreation and for food.

Water is abundant on the site. The water table is generally high and most families obtain good drinking water from shallow wells on their farms. Streams provide drainage so, in flatlands, obstructing them causes occasional flooding.

I.1.3. Infrastructure:

Soils at the site vary from deep, well-drained and fertile, to shallow and poor. Land use directly reflects soil quality. The best soils support continuous, intensive agriculture; the poor ones, sparse production of a mixture of agricultural, livestock, forest, and wildlife products. Infrastructure relates directly to site quality. A network of roads and old railroads penetrates the best production zones and connects them to Panama and to the rest of Costa Rica. The least productive areas have no roads. Primitive roads existed at one time to extract timber and cacao but these have fallen into disuse and have become impassable to vehicles. People and their goods move about on horseback and on foot. Similarly with electricity; the area surrounding

the project site has electricity but the small settlements and isolated farms within the site do not.

I.1.4 Protected Areas:

The high diversity of ecological conditions and relative lack of disturbance of the site make it suitable for a wildlife refuge. By Presidential Decree of July 14, 1985, part of the site formally became the Gandoca-Manzanillo National Wildlife Refuge. The refuge includes 5,013 hectares of continental habitat and 4,436 hectares of marine habitat. All of the refuge lies within the project site. Additionally, the site includes approximately 6,000 hectares inland of the refuge which serve as a buffer zone between the refuge and the zone of intensive agriculture.

I.2 Project Description and Analysis

I.2.1 Introduction:

The Gandoca project began nearly ten years ago when individual members of ANAI and the organization itself purchased farms in Gandoca. The ANAI people wanted their farms to attain high but sustainable levels of production of tropical crops. They intended to work with existing crops in the area, mostly tree crops and other permanent crops, and also introduce new ones. Furthermore, they intended to maintain the existing environment of Gandoca, its mix of forest, plantation, and field, domestic livestock and wildlife.

I.2.2 Agroforestry

From the very beginning, then, ANAI's activities focused on both development and conservation. The project began with agroforestry development. This entailed identifying local crops and promising crops for introduction, obtaining good quality seed and plant materials, establishing nurseries and distributing the resulting seedlings. Currently, ANAI operates about two dozen nurseries working with nearly twenty species of plants. The most important plant, accounting for 75% or more of the stock of some of the nurseries, is cacao. Cacao owes its prominence to several factors:

- local farmers have a long history of planting and harvesting it;
- it has generally been marketable at favorable prices so farmers view it as a dependable commercial venture;
- it is ecologically suited to the area in that it produces well in a tropical, moist climate; its cultivation mimics natural forest and does not expose soil to high erosion;
- although it suffers from a fungal disease, the disease can be controlled by simple mechanical means available to local farmers.

Other locally used plants propagated at the ANAI nurseries include peach palm, several varieties of citrus, soursop, and two fast growing timber trees, blackwood and laurel. Black pepper, vanilla, mangosteen, and starfruit are among the species introduced at the nurseries. ANAI plans to continue operating its nurseries, employing local labor paid in plants from the nurseries, and gradually involve itself in crop and farm management activities as well. The plan appears to be unfolding apace with good acceptance and participation of local farmers.

I.2.3 Conservation:

The other segment of the project, conservation, began after agroforestry development was underway. It unfolded from the basic land use patterns of the project area which retain large amounts of land in forest and plantations that support diverse wildlife. The whole gives a pleasing appearance and feeling about the area, valued by the local people as well as by ANAI. The local farmers perceive portions of their farms as reserves and prefer neither to fully develop them themselves nor sell them to others. This attitude toward the land and its resources gradually gave rise to the concept of joining numerous farms in a comprehensive unit for conservation that included continued use for farming. That concept was converted to reality with the creation of the Gandoca-Manzanillo Wildlife Refuge.

But all was not and is not harmony at Gandoca. The area owes its character to its precise conditions of relative isolation and limited infrastructure. If a good road were built into the area, everything would change. Access to markets would improve; more land would go into more intensive production; highly exploitive land uses would proliferate; population would increase; squatters would invade existing farms; forest and wildlife habitat would decrease. People's incomes might improve but quality of life might deteriorate.

A proposal to build a road through the area arose in 1984. The proposed road would have followed the coast from Manzanillo to Gandoca and then crossed the Sixaola River plain to the town of Sixaola. ANAI and the communities in the Gandoca area opposed the road. With funding from World Wildwife Fund, they commissioned an environmental impact statement that recommended alternative access by improving the existing road from Puerto Viejo, through Bribri, to Sixaola. This recommendation was accepted and the road improvement work has begun. People in the area envision an eventual road system that will give access to all the communities by:

o improving the existing road from Puerto Viejo to

Manzanillo;
- o rebuilding the derelict road from Sixaola to Gandoca;
- o constructing new spur roads to San Minguel and Mata de Limon

I.2.4. Land Titling:

The controversy over the road underscored a long standing problem in Gandoca and neighboring communities; hardly anyone has title to land. Most people purchased rights to their land or established rights by possession years ago. Land occupancy has been stable and people recognize each others rights and boundaries. But most people have no document to support their possession or their boundaries. Their lands are vulnerable to incursion and dispossession by squatters, known locally as "precaristas". Farmers fear improved access to the area would bring a wave of squatters, as has happened elsewhere in Costa Rica, that the farmers could not contain. Legal title to their lands would strengthen the farmers' position against squatters. It would also enhance the value of their land for sale and open access to credit and other services.

Gradually, ANAI and communities in the Gandoca area came to believe that titling their lands was central to their security and to the advancement of development. ANAI, therefore, embarked on a project to obtain land titles. In Costa Rica, the land titling process is complex, time consuming and expensive. So much so, that farmers with modest incomes simply can not afford it. It is safe to say that, but for the presence of ANAI and the outside financing ANAI could attract, Gandoca farmers would have no realistic chance of gaining title to their lands. The World Wildlife Fund provides most of the funding to sustain the land titling project.

In Costa Rica, the process for obtaining land title consists of two major phases: "catastro", or platting, and titling, per se, or the official documentation of ownership of land. The Office of Plats, a division of the National Registry, carries out the platting part of the process. For rural land, the titling part of the process can occur in one of two ways: by authorization of title by the National Institute of Agrocultural Development, IDA, or by judgment of title by a national court based on an evidentary proceeding that demonstrates possession. Neither part of the process is simple or quick.

Wisely, ANAI has hired Costa Rican professionals to coordinate the land titling effort. They also used funds in the land titling project to hire lawyers, purchase aerial photographs and maps, and pay for field operations of platting teams from the Office of Plats. Community members participated by clearing a strip five meters wide along their

boundaries so the boundaries would be visible in aerial photographs.

By July 1987, the platting processing had advanced nearly to completion. Boundaries were marked on the ground; aerial photographs for the whole area were completed and combined into mosaics; ground checking against the photomosaics was completed; and individual plats had been drawn for most parcels. When all the parcels have individual plats accepted by their owners, the titling phase can proceed.

For titling, ANAI and the communities prefer the relatively simpler and more direct route of authorization of title by IDA. They have already had preliminary discussions with IDA and IDA knows the plats are nearly completed. Some obstacles remain in the IDA course, however. Quite a few of the farms seeking title lie inside the boundaries of the National Wildlife Refuge. IDA authorizes title for agricultural uses and the question of whether its authority extends to lands within refuges remains unanswered. IDA may decline to authorize title to these lands. As a further complication, under Costa Rican law, lands titled by IDA cannot be sold within 15 years of the date of title. Although this law is not rigidly followed, some farmers are wary of incurring its restrictions.

The judicial process for titling, over and above the uncertainties, delays and costs that courtroom proceedings always entail, has a serious complication for Gandoca. To demonstrate possession under Costa Rican law, one must show "improvement" of the land under possession. For rural land, land clearing constitutes the most common and generally accepted form of improvement. Conversely, lands claimed by possession but remaining in forest could be declared unimprove, thereby negating possession, ownership, and the right to title. If people whose land lies in the wildlife refuge cannot obtain title unless they clear the land, then the land must remain untitled or lose its capacity to support wildlife. This is an unpleasant dilemma, indeed, for ANAI, the farmers, and the refuge.

I.2.5. Management:

Thus far ANAI has concentrated its efforts on immediate issues: agroforestry technology, appropriate roads, creation of the refuge, and land titling. Several of these issues have been resolved satisfactorily and the others appear headed for satisfactory resolution. Even if all are resolved, however, ANAI will not have fully attained its dual goals of development and conservation. In particular the conservation goal will remain in jeopardy because population will increase; lands will be sold to new farmers; existing farmers will intensify land use and also bring more land into

production; forest and wildlife products will increase in value.

The key to attaining the conservation goal is resource management.

I.3 Social Aspects

I.3.1 The Settlements:

Three ethnic groups are present in the project area: blacks (at Manzanillo and Gandoca); mestizos (Gandoca, San Miguel, and Barra de Sixaola); and Indians (a few individuals scattered through the area, but mainly residing at the Cocles Indian Reservation, bordering the project area).

A total of 1,500 people are estimated as the population of the project area, although no information was available on the precise numbers by ethnic group. Rather, some information was provided as to the size of each settlement. Thus, Gandoca is estimated to house around 600 persons; Manzanillo would consist of some 200 persons; the area along the coast near Manzanillo another 150; Barra de Sixaola another 100; and the rest (300 persons) scattered along the inland roads that traverse the region.

Each one of the ethnic groups holds a different history of occupation in the area. The blacks, English speaking, are located along the Atlantic coast; their settlements date from approximately 100 to 150 years ago, when they began establishing small towns on lands previously occupied by indigenous groups. Many of them were hired by the banana companies as temporary or permanent labor. Those companies have become less active in the last few years, causing a significant upheaval of this group's economic stability. The black communities are engaged in non-intensive agriculture, wood exploitation, fishing, and small trade activities.

The mestizo group, on the other hand, arrived much later than the blacks did, in search of land and attracted by the employment opportunities offered by the banana companies. They tend to come not only from other regions of Costa Rica, but from other countries in Central America as well. Many still work for the banana companies, although the latter have greatly reduced their operations in the area. Most former employees of these large companies have remained in the area, located a plot that could be suitable for agriculture, and, either bought it from the companies, or simply settled on it until further clarification of their use rights is needed. Agriculture is their main occupation, particularly cacao and banana cultivation. A number of them are also engaged in cattle raising. Although their sources of income tend to be more stable than those of the blacks --and the Indians for that matter-- they lack the necessary transportation and

marketing means so as to achieve substantial improvement in their living standards.

The Indians descend from the Miskito group principally; they are essentially hunters and gatherers, practicing limited agriculture. Although their main residence lies outside of the project area, their hunting has an impact upon the faunal resources protected in the refuge. Their cooperation in resource protection would be a significant asset to the overall viability of the project.

I.3.2. Community Organization:

Two of the three groups in the project area have, or have had, their own traditional power structure and means of social mobilization the blacks and the Indians. The blacks were apparently organized into "lodges" --reminiscent of the long standing Caribbean tradition. The Indians followed a pattern of community authority along family and age lineages. Both have been all but destroyed by the insertion of civilian authority structures that are foreign to their own. The Costa Rican government has fostered the creation of "Asociaciones de Desarrollo" (Development Associations) for each of the minor administrative units, of which Gandoca is one. These associations respond directly to the government, and although useful, are by no means an adequate substitute to internally developed power structures.

In response to this situation the project has adopted a dual strategy. On the one hand it is fostering the creation of "comites" (committees) within each small community --at the moment one is taking shape in San Miguel, and another one in Barra de Sixaola-- as intermediate entities that could be strengthened by popular consent and community representation. These committees are not to respond to project interests, but rather, they would assumme broader functions of community mobilization around productive activities -marketing, acquisition of inputs and technology, etc. The nurseries promoted by the project have become, in fact, the seed for this further organization effort.

On the other hand, the project has also fostered the creation of two community groups: the "Asociacion de Pequenos Reforestadores de Talamanca" and the "Asociacion de Pequenos Productores de Talamanca" (small foresters and small producers, respectively). These two associations count on a group of directors (among whom project "technicians" or promoters are principal figures) who are working very actively to increase enrollment from all ethnic and economic groups in the area, and to plan for the improvement of the area's agricultural production. Questions of potential conflicts of interests among the various communities have not been raised yet; presumably, those would be confronted when and if they arise in the future. For the time being, the

associations are busy consolidating their operations capital --through membership contributions-- and starting basic infrastructure to facilitate their work.

Both organizational strategies adopted by the project seem well taken and appropriate. The amount of time and interest that the project staff has put into bringing these organizations about is clearly consistent with the project's contention that community organization will bring durability and continuity to the project in the long term. Project support to both these initiatives seems necessary for the time being, at least until the committees become formally established units and the associations achieve financial and technical stability. Neither of these two requisites seems far away; they could both be achieved in the short term.

I.3.3 Community Participation:

The three groups referred to here share a central interest in the project, namely, the latter's ability to provide them with land titles. The titles are essential instruments to gain access to credit, technical assistance, etc. and are certainly the most significant asset to acquire in the view of these communities. There also seems to be great interest in the possibility of preserving faunal resources, as those are valued as protein inputs to all these groups' daily diet; the Indians are particularly dependent upon wildlife for their nutrition, while every group would find having such faunal resources within their reach of significant value, as beef and fish are becoming increasingly expensive.

By trying to solve issues that bear crucial relevance for the communities, the project has been able to create extremely positive conditions for public participation in project implementation. Such participation has materialized in at least the following actions:

(a) land marking to assist aerial photography needed for the elaboration of site and individual cadaster plats;
(b) labor input to the construction and maintenance of plant nurseries;
(c) strong community leaders' participation in the organizational initiatives undertaken by the project staff;
(d) delegations' attendance at meetings with local officials in public institutions related to the project;
(e) individuals' availability for training as para-professional assistants in the agricultural extension programs;
(f) facilitation of transportation for the mobilization of project personnel within the area;
(g) provision of local materials for the construction of project-related structures.

A different level of commitment and support is observed in relation to the establishment of the wildlife refuge. A first, most important factor is a recent rather negative experience in neighboring Cahuita where a national park was established through the eviction of previously settled small holders. This has created a strong rejection of the idea of park formation among the communities in the region. Any suspicion of a similar intention for the Gandoca-Manzanillo area would raise the people in arms against the project. However, it is not very easy to explain the fundamental difference between a national park and a wildlife refuge, in part because the regulations for wildlife utilization within the refuge are not available or publicized. Insofar as no clear management plan exists for the area, there will be the risk of community rebellion in light of uncertainty. A second decisive factor here is the fact that the refuge was established earlier than originally planned --in response to the threat of a possible road bisecting the whole area; the refuge was seen as a means to counter that initiative with the argument of defense of a legally established natural area. The refuge has been created, then, before the farmers gained access to their titles; this has raised rumors of foul play and potential ineffectiveness of the land titling effort in refuge areas. True enough, the situation of legal titling within the refuge is by no means clear, new legislation (Forestry Law, 1986) and bureaucratic obstacles may, in fact, threaten the project's ability to continue its titling process unabated.

Given these circumstances, great uncertainty covers the issue of the refuge. It seems fair to say that the absence of clear directives and government statements guaranteeing titling within the refuge land is undermining the project's credibility. An expedient solution must be found for this conflict in order to protect the effective rapport that exists at the moment between the project staff and the communities.

I.3.4 Relevant Socio-economic Factors:

The overall level of income in the communities that are involved in the project is rather low and undependable. In part due to the great risk that tends to be involved in each economic activity and in part due to the lack of large markets for a single product cultivation pattern, these communities have resorted to combined production systems that include not only agriculture and cattle raising, but also wildlife hunting, wood collection, and other means of direct resource utilization. In other words, the lack of economic stability makes these communities prone to resort to all available means of income generation, regardless of the actual value of the natural resources for their protective

natural functions.

Because of this most important reason, the provision of alternative and viable sources of income is considered by the project a major prerequisite to improved resource management. This evaluation tends to agree with that. However, improved income does not seem to be a sufficient condition to ensure rational management; such is the role of the external assistance component.

I.3.5 Technical Assistance:

The whole Limon Province has traditionaly been a neglected area. Only during the last 5 to 10 years have access roads made the needs of local communities more visible to the central government. So far, little direct assistance flows from San Jose to this province; even less materializes in actual extension work with the farmers located in the most remote areas, such as those involved in this project in particular. In fact, under current circumstances, there could be little hope of any significant increase in the attention given to the needs of the individual farmer by conventional channels of field assistance.

The Gandoca project is, in this respect, a major input to the farmers' lives, in spite of its limited capacity to provide personalized help to the local community members. To overcome its lack of extension personnel, the project is promoting the training of community members in agricultural development, pest control, marketing, etc. so as to enable them to perform a service role to their communities. If the project manages to produce a group of local "promotores" able to respond to the most basic needs of the farmers, and sufficiently knowledgeable as to know where to refer them, this would be a great achievement.

This project converts external financial assistance into field support for needy individuals and communities, in an area where such inputs are not likely to come from anywhere else.

It is important to acknowledge that Gandoca is fundamentally a community development project, not, in fact, a habitat preservation or conservation one. The latter objectives are indeed present in project planning, but they are considered a very desirable outcome, not a sine qua non requisite for project success.

If the land titling process is completed, a significant portion of the land within the refuge will in fact belong to individual farmers. The extent to which these farmers are willing to engage in "appropriate" (read: "directed") resource management, would depend on: (a) the rapport created between the project--the refuge--and the people; (b) the

degree of participation the communities have had in the drawing of the land use plans for the area; (c) the ability of the project to initiate alternative low-impact income generation activities; and (d) the ability of the governmental institutions in charge of the refuge, to design acceptable but firm mechanisms to regulate further fragmentation of the land parcels.

At any rate, a refuge as traditionally conceived -- occupying a discrete piece of territory, where there is close control on fauna and flora collection, and where external impacts are kept at lowest possible levels-- would most probably not be what will emerge from the Gandoca Project. On the contrary, the Gandoca- Manzanillo Wildlife Refuge would be an open range site, where resource utilization levels are controlled by self-restraint mechanisms, with limited (but hopefully appropriate) guidance from the refuge administrators (management plan).

The fact that the project has courageously --and so far successfully-- tackled what is a major social problem in the area and the whole Latin American region, namely land titling, deserves recognition. The project identified land tenure insecurity as a principal obstacle to improved land management in the region. Although it is too early yet to discuss the eventual effectiveness of that strategy, there are a few facts that are already evident and that shed light upon its validity: (a) the project's willingness to help in the solution of this central problem has gained the project the confidence of the local communities, and concomitantly, a high degree of community participation in its activities; (b) readily available funds for the titling process have provided the fuel for an unprecedented collaboration between non-governmental and governmental organizations for this purpose, proving that the latter could work efficiently if necessary inputs and sufficient initiative are present to foster their participation.

Although the project is experimental (especially as it assumes innovative tactics like land titling as a means to achieve rational land management, for example), it has not adopted controlled experimentation conditions; there is scanty recording of the process and results of specific project activities; there is also little data and information on previous and current socio-economic and technological conditions; there has been no attempt made at describing or analyzing the informal decision-making mechanisms utilized by the project. In short, after project completion, it will be very difficult to substantiate with adequate records, what were success and constraint factors, and what were circumstances peculiar to this case, that limit its replicability.

I.4 Institutional Aspects

I.4.1. Institutional Arrangements:

The overall institutional framework that surrounds the Gandoca project is presented in the following table:

INTERNATIONAL ORGANIZATIONS	WWF/USAID	+	OTHERS	
LOCAL INSTITUTIONS	ANAI			
	GANDOCA PROJECT			
	nurseries	technical assistance	land titling (inc.refuge)	other projects
Government Agencies:				
Cadaster				
National Geographic Institute				
Wildlife Division				
Agricultural Development Institute				
				CIDESA supervision coordination
COMMUNITY ORGANIZAT's	DEVELOPMENT ASSOCIATIONS			
	COMMITTEES (San Miguel B. Sixaola)	SMALL FORESTERS & PRODUCERS ASSO's		

Under this structure, ANAI is the central implementing institution, supported closely by a Costa Rican non-governmental organization (CIDESA). The governmental

agencies perform fundamental roles the National Geographic Institute and the Agricultural Development Institute in land titling; the Wildlife Division in the creation and implementation of the refuge). These are vital components of the project, which, to be permanent, must be legalized and insitutionalized by those branches of the central government. Those shown here as principal community organizations, previously existing (Development Associations), and newly created (Committees, and Small Foresters Association and Small Producers Association of Talamanca) are long-lasting achievements of this project. These latter are viewed as playing a central role in providing the project with continuity after formal project cessation.

The collaboration of CIDESA with ANAI is facilitated in clear terms. The principal local coordinator of the land titling and refuge component (Costa Rican, Mr. Alberto Salas) is Co-Director of CIDESA. The participation of public agencies is facilitated by formal covenants with ANAI. The relation to the newly created community organizations remains a dependent one, as the project is providing the funds and motivation to keep them running so far.

I.4.2 Profile of the Principal Implementing Institution: ANAI:

ANAI's basic structure is depicted in the following table:

GENERAL ASSEMBLY

BOARD OF DIRECTORS

DIRECTORS

Project Employees

The General Assembly consists of 12 people, including the three Directors and nine associates who are farmers and community representatives from all project sites. The Board is composed of two of the three Directors, and three Costa Ricans also from the communities. The three Directors, all North American, make decisions by consensus. The employees are twelve to fifteen people, among whom are five of the assembly members.

It is noteworthy that this structure is sui generis: (a) the general assembly is composed of the same persons who are in charge of the executive posts and hired by the institution for such roles, plus others also hired by ANAI, although occupying subordinate positions to the Directors; (b) the

three Directors are present in all decision making bodies of the organization; (c) there is no established mechanism for rotation of the Directors; in fact they can serve permanently, as they are not elected, but rather self-appointed. Clearly, this structure partially mimics the framework used in other non-governmental institutions, but is far from providing some of the essential elements of such structure for an NGO, namely: (a) presence, in the General Assembly and the Board, of independent local community members; and (b) a clear accountability line between the executive and the policy-making bodies.

Thus structured, ANAI is a strongly personalized institution, where the line of thinking of its Directors, rather than a formalized process of planning and decision making, governs the actions taken by it.

As concerns its work program, ANAI Directives are clearly committed to "find ways to conserve and manage natural resources while making them available for useful development to the communities that need them most" (paraphased from Jim Lynch). The project really doesn't have strict boundaries for the reach or number of the activities it may pursue. New responsibilities are assumed as they arise. This has resulted in ANAI's directors/staff (of whom one is absent two thirds of the year, every year) devoting themselves to an array of different activities that range from negotiating with government officials, to identifying suitable seed for a desired crop, to attending international conferences if (strictly) necessary, to driving and walking in and out of the area to take provisions or tools, etc.

From what could be seen during the evaluation, the directors/staff may find it difficult to allocate their time in such a way as to have still sufficient of it to devote to the central tasks of the project, as they often become involved in solving urgent and demanding problems that come their way. Although some of this prioritization problem could be solved by hiring additional help --precisely to cope with the emergency actions, or to take care of the routine activities, whichever is preferred-- ANAI's directors have expressed their unwillingness to "grow" in staff terms. On the other hand, improved effectiveness could be achieved by making the staff's actions more systematic, or assuming a clearer division of tasks. However, this option goes definitively against the grain and style of ANAI --which prefers shared and diffuse responsibility over any structured arrangement. Thus, the cost of maintaining this policy would most probably continue to be an overwhelmed staff, and frequent delays in activity completion.

A final point regarding ANAI's work philosophy or model has to do with its profound interest in "doing work". From their point of view, devoting time to taking systematic

account of project development, or to testing the initial hypothesis that led to the project --namely, that land titling would release the pressure upon the farmer to use his/her land unwisely-- does not seem warranted. This unwillingness to reflect upon everyday occurences may be counterproductive for WWF's effort to derive insights and generalized observations from the projects that make up its Wildlands and Human Needs Program. To project directors, the only means to perform such work of abstraction and reflection would be via an external agent, hired for the purpose.

ANAI has no permanent source of core funding; most of the institutions that provide them with funds do not accept that the NGO takes overhead. Thus ANAI's directors derive their salaries from shares of their time devoted to individual activities charged to each project. A similar mechanism is used to provide for San Jose office rent, and other operating expenses. This situation may not seem sustainable for most NGOs; however, in the case of ANAI it may be convenient, as according to its directors, there is no commitment to permanence in Costa Rica from their part. Therefore, once ANAI's principal projects are completed, the Directors may reassess their plans for the future.

Project funding, on the other hand, has not been as consistent and timely as needed. Delays have caused great stress, and the diversion of extra time to locate emergency funds to cope with previously acquired commitments.

The overall institutional strategy followed by ANAI is one of:

(a) maintaining a low profile with the communities and the government agencies;
(b) creating a community support base to back up their call for governmental action;
(c) strong inter-institutional coordination with relevant government agencies;
(d) search for eventual adoption of project activities by local government agencies.

At this stage in project development, ANAI seems to see itself enhancing its role in environmental education in the near future. Given their lack of experience in this area, external help would be needed and appreciated.

I.4.3 Associate Implementing Institution: CIDESA

CIDESA (Corporacion de Investigaciones para el Desarrollo Socio Ambiental) or Socio-Environmental Development Research Corporation, is a relatively new Costa Rican NGO, which has evolved to a great extent in response to the Gandoca project's need for a national person/institution

that could negotiate and relate to local governmental agencies. For ANAI such relations were cumbersome --due to the fact that it is basically an expatriate organization.

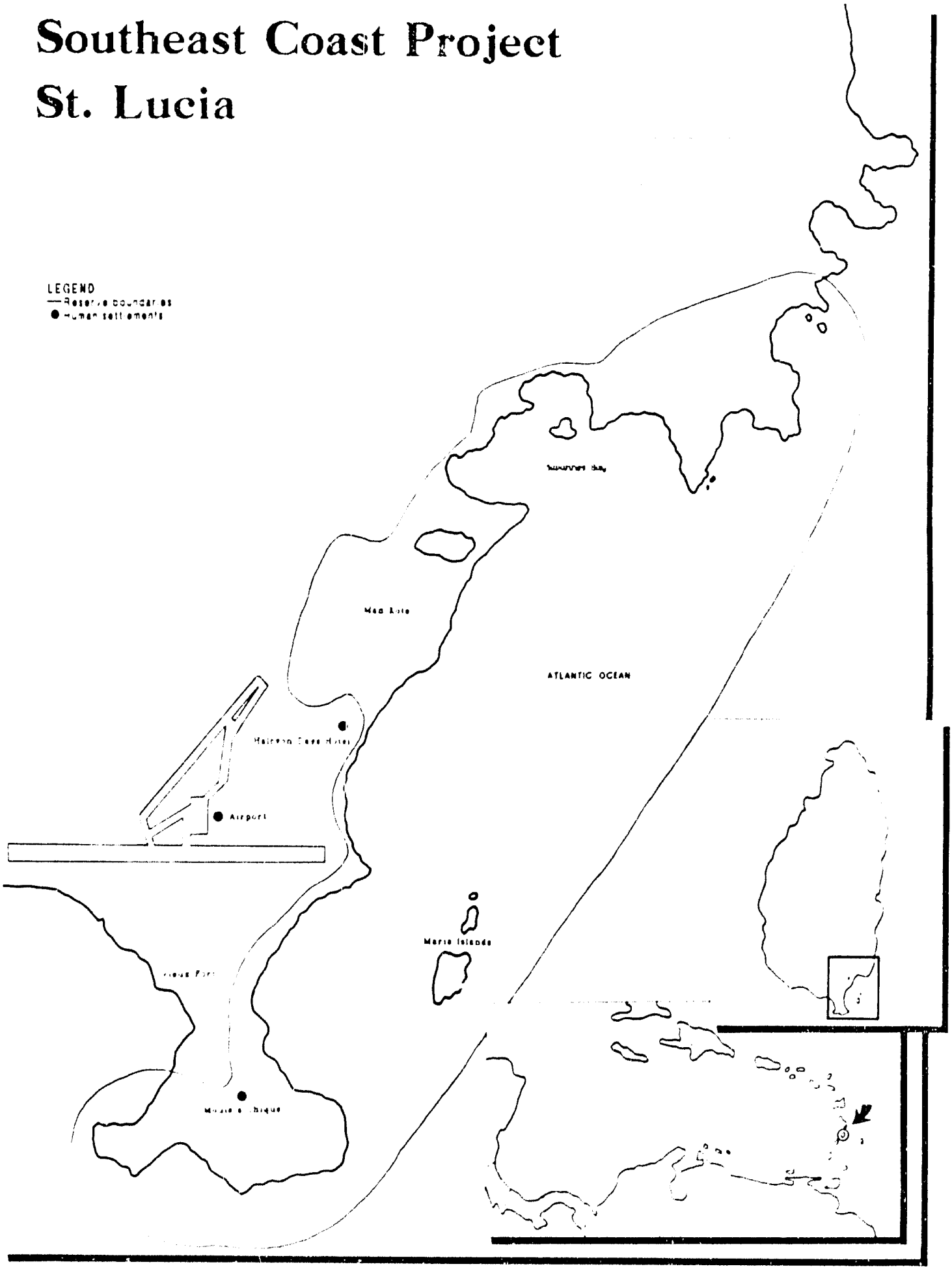
CIDESA, led by Alberto Salas (Co-Director) is engaged in creating the infrastructure for CIDESA to undertake social, economic and environmental research and to implement projects. Given their recent appearance, there is little to be said about their record. However, based on observations of Salas's field rapport and experience, the direct participation of CIDESA as recipient of funds and principal implementing institution in all matters related to socio-economic and community development would be recommended.

In fact, if ANAI continues to perform its role in the technical aspects of the project, CIDESA could very well assume responsibility for the social/community aspects, if possible in direct contact with the WWF, so as to establish a relationship that may last after project completion, especially if ANAI decides to pull out of the country.

Finally, it is possible that CIDESA could perform the role of project analysis and systematization (referred to above when discussing ANAI) for the benefit of the Wildlands and Human Needs Program of WWF if adequate guidance is provided. In synthesis, CIDESA seems to be a promising institution, one that could grow to be a significant force among Costa Rican NGOs in the future, especially given its interest in socio-environmental issues and their relation to development.

As concerns the project's connection with the Wildlands and Human Needs Program, project staff seemed rather unaware of the other projects that are taking place under Program auspices. Consistent with the Directors' line of thinking, they seemed interested only in those projects or activities that have direct relevance to what Gandoca is doing. However, from the point of view of the Program, cross-fertilization among projects would seem a most beneficial process. The Program shouldn't underestimate the potential value of enhanced communications among projects that, each along different lines, attempt to achieve similar ends.

Southeast Coast Project
St. Lucia



II. SOUTHEAST COAST, SAINT LUCIA

II.1 Site Description

II.1.1 General:

The site of the southeast coast of St. Lucia project consists of ocean, off-shore islands, coral reefs, lagoons and bays, mangroves, beaches, coastal lowlands, coastal headlands, and interior uplands. The climate is tropical marine and rather dry due to frequent wind and soils with low water holding capacity that accentuate the effects of modest rainfall.

II.1.2 Land and Natural Resource Use:

The interior uplands of southeastern St. Lucia support a mixture of subsistence farming, low intensity grazing, and scrub forest. Apparently the uplands had been entirely deforested in colonial times, much of them planted to commercial sugar plantations. As sugar production became less economic, some land was occupied for farming by small holders and some regenerated into forest. The forest suffers from burning, woodcutting, and grazing by goats, sheep and cattle.

The coastal lowlands are used for recreation, raising coconuts, and low intensity livestock production. Some large landholdings appear underused. Beaches provide sites for recreation and fishing.

The coastal headland of Moule a Chique, adjacent to the town of Vieux Fort, provides residential space for expansion of the town and protects it somewhat from the prevailing easterly winds. Dry forest, from which people obtain firewood, a little charcoal and palms for brooms, covers most of the headland.

Mangroves occur in several places along the coast. They tend to be fairly small, unconnected to each other, and subject to widely different uses. The mangrove at Savannes Bay has little human penetration. In contrast the Mankote mangrove serves as a significant source of charcoal that is rapidly being depleted. The mangroves concentrate nutrients and release them into the bays beyond their fringes, providing significant food sources for both plants and animals.

The lagoons and bays represent areas of relatively calm sea protected from the rougher ocean by off shore reefs and indentations in the coastline. These areas harbor sea grass beds which, in turn, harbor edible sea urchins known as sea eggs. They also provide habitat for collecting and growing

sea moss, the local name given to several edible red algae, and for fishing.

The coral reefs perform the physical function of protecting the coast. They also provide habitat for fish and lobsters and integrate with the ocean which supports commercial fisheries of lobster, pelagic fish like tuna, and the mix of local fish referred to as pot fish.

II.1.3 Protected Areas:

The Maria islands, two islands of 25 acres and 4 acres, respectively, one half mile east of the southeast coast of St. Lucia constitute a formal protected area, the Maria Islands National Wildlife Refuge. The protected area extends into the ocean adjoining the islands. The islands contain two endemic species, one lizard and one snake. They also provide nesting sites to colonies of several seabirds, mostly terns.

ECNAMP, The Eastern Caribbean Natural Areas Management Project, promotes informal protection of several areas on the southeast coast, notably the mangroves at Savannes Bay and Mankote and the seagrass beds in the shoals between the Maria Islands and the mainland of St. Lucia.

Local communities share decision making and management with ECNAMP as regards selection, demarcation and use restrictions of the informal protected areas.

II.2 Description and Analysis of the Project

II.2.1 Protection of the Maria Islands:

The Maria Islands were formally designated for protection in 1979 under the management of the St. Lucia National Trust. ECNAMP has collaborated with the National Trust over the years. Together, the two organizations have achieved protection of the islands, respected by local residents and visitors alike.

The protection springs from education. A visitor center located on the shore opposite the islands explains them to visitors. People can visit the islands directly except during the seabird nesting season from May through July. Until 1984 the seabird nesting sites suffered from egg collection by fishermen. But in 1985 ECNAMP persuaded the fishermen not to collect eggs. The fishermen cooperated because they value the birds which congregate at sea near schools of fish, thereby indicating where to fish. Similarly the fishermen have honored a no fishing zone around the islands whose boundaries were jointly determined by the National Trust, ECNAMP and the fishermen. At the fishermen's suggestion, National Trust marked the boundaries of the zone

to make it clearly visible.

II.2.2 Fishing Community at Pierrot/Savannes Bay:

ECNAMP has worked with the fishing community at Pierrot/Savannes Bay for several years. Pierrot, where the fishermen live, is more than a mile up a steep hill from Savannes Bay, where they keep their boats. They used to pack their motors and fishing gear from their homes to the boats and back every day they fished. The boat landing site, a muddy spot at the edge of the mangrove, served as a marketing area for their fish but it was unattractive to their customers.

Construction of a building at the site solved both of the fishermens' problems. They have a secure place to store their gear and they have a clean, attractive site to sell their fish. They didn't do it alone. ECNAMP persuaded World Wildlife Fund to finance the building. They also secured durable legal rights for the fishermen to use the landing and marketing area which was located in the "Queens Chain", a strip of land 186 feet wide along the whole coast of St. Lucia declared public by the Crown centuries ago but often preempted for private use in modern times. The National Trust holds the land and has a long-term use agreement with the fishermen. The fishermen contributed labor and some materials to build the building.

In just a few years, standard of living has increased substantially for the fishermen. Several families own new pickup trucks now. Before, the entire community had access to only one rundown pickup.

II.2.3 Charcoal Producers at Mankote Mangrove:

The charcoal producers rely almost entirely on the Mankote mangrove, with an area of about 150 acres, for their supply of wood to make charcoal. They cut the mangrove and it coppices so that it can be cut again in the future. Over the years the cutting cycle has become shorter and now the trees are cut after only two or three years of growth, producing sticks as small as one inch in diameter. The total area of the mangrove seems to be shrinking and attempts to replant have not been successful so far.

The proposed solution for the charcoal cutters consists of: establishing forest plantations to provide an alternate source of wood; engaging in communal vegetable production for additional income; and decreasing the annual cut of mangrove. The St. Lucia Forestry Department began planting leucaena plantations on public land near Aupicon, the village where the charcoal producers live, five years ago and have planted a few acres more in each subsequent year. The plantations have not prospered. A few, skinny leucaena trees

poke out of the brush that has come up around them spontaneously. Explanations for the poor showing vary --poor soil; dry climate; inadequate brush removal; leaving care of the plantations with the Forestry Department rather than the charcoal producers.

Communal vegetable farming has begun by clearing brush from several acres of relatively flat, government-owned land and plowing it with a tractor rented from another village. The charcoal producers do not have any land of their own. They practice some subsistence farming on public land or at the sufferance of private landowners, but they have no machinery nor any experience growing vegetables for market. Nonetheless, they are enthusiastic about the farming venture and expect it to be successful as it has at the village nearby from which the tractor was rented.

In the absence of clear success of either the leucaena plantations or the vegetable production, however, over harvesting the mangrove continues. In sum many, the solution for relieving pressure on the mangrove and improving the charcoal producers livelihoods appears well conceived but, thus far, poorly executed.

II.2.4 Sea Moss Production:

Sea mosses, the local name for several agar producing species of red algae, occur naturally in the coastal waters of St. Lucia where they attach themselves to rocks. People collect them by simply gathering and sell them to local markets. Sea moss is used for refreshments and probably could sell as agar in international markets.

Recently ECNAMP has trained local people to grow sea moss on small rafts. The rafts, made of bamboo poles and light nylon rope, are inexpensive and simple to construct. One person can easily build several in a day. The technology for raising the sea moss is simple also. Strands of algae that have been collected in the wild, or taken from other rafts, are woven at short intervals into the lines supported by the raft. The strands begin to grow when the rafts are placed in shallow water with gentle to moderate wave action. Raft owners typically check the rafts every few days to remove dirt and unwanted plant growth of other species and make any necessary repairs. In about eight weeks the rafts are ready to harvest, each eight to ten feet of line producing one pound of dried sea moss worth about EC $25 (US$10).

Production from rafts began only a few months ago and has attracted a small number of practitioners. Most producers engage in other economic activities in addition to growing sea moss, thus exhibiting the typical pattern in St. Lucia of multiple sources of income.

II.2.5 Sea Egg Management:

The sea egg, a type of sea urchin whose edible reproductive organs are considered a delicacy in the Caribbean, lives in sea grass beds in coastal shoals. They are harvested by simple gathering and, because they are easy to see and easy to retrieve, they can easily be overharvested. A few years ago they had disappeared from the bays of the southeast coast of St. Lucia, but then reappeared. Today they continue to exist, though in short supply under intense harvesting.

The basic biology of sea eggs - reproduction, migration patterns, growth rates, - is not well known. ECNAMP has undertaken a project to study sea egg biology and apply the information to manage sea egg harvesting. The people who harvest sea eggs participate in the study. In Vieux Fort Bay they have voluntarily imposed a closed season on harvesting until low populations replenish themselves.

II.3 Social Aspects:

II.3.1 Project Beneficiaries:

The project works with a number of specific groups, rather than with whole communities. Those groups have been identified given their function regarding specific natural resources, whose protection, according to project conceptualization of the problem, depends on the relaxation of external pressure. Thus, two resource use problems have been chosen as the focus of project's work: (a) overharvesting of mangrove for charcoal production; and (b) lack of protection of faunal and floral species in the Maria Islands Reserve. In each associated case a number of social groups have been connected to current resource exploitation; the project focuses on providing those groups with alternative sources of resources and income.

There are three groups with whom the project is working closely: the charcoal producers (related to the mangrove); a small group of fishermen, and assorted groups of urban and rural dwellers who may be interested in pursuing seamoss cultivation as an alternative source of income (both of these groups relate to collection of bird eggs and sea urchins in the Reserve and its surroundings).

A short description of each of these groups follows:

II.3.1.1 Charcoal producers:

Living in small, precarious housing at Aupicon (within the Pierrot area), the charcoal producers are considered one of the most marginal groups in southern St.Lucia. Mostly

black, with a certain mixture of east Indian characteristics, this group does not hold a traditional tie with mangrove utilization that goes beyond approximately the last twenty years. Before that, they were employed by the large sugar cane companies and probably had some affiliation to the provision of services to the US military base that was installed in St.Lucia in the 1940s.

Exploitation of mangrove for charcoal evolved as a relatively recent option, in order to satisfy urban and rural markets in this section of the country. Charcoal is more widely used than gas because of its low price and availability in small quantities. Besides selling it at local markets, charcoal is also used for household consumption.

Utilization of the mangrove ecosystem by this group is limited to collection of wood for charcoal; limited, sporadic fishing into the mangrove also seems to take place. Mostly, members of the group collect the wood weekly or so, (no clearly set timing for collection seems to exist), pile it up until it reaches an acceptable amount, and burn it into charcoal on site. No defined territorial boundaries have been assigned per family unit; thus, each family, working as a team, selects sites for collection surrounding the pit (for burning) it uses, in a rather random fashion.

Other groups from other rural sites or from town compete with this group for the wood. Since the charcoal producers have no legal property rights to the mangrove (which is entrusted to the administration of the National Development Corporation, like most former "crown lands" -including a strip of land along the entire coast), and, furthermore, they hold no traditional access right to it, such competition is significant.

The project has negotiated with the Forestry Division the location of a leucaena plantation nearby the site where the charcoal producers live. The plantation remains under the ownership and management of the Forestry Division. Although tending of the plantation seems to be insufficient, no direct allocation of responsibility to the community for tending it has occurred yet (although such is the direction that the project would like to give to the plantation in the future). For the time being, the plantation is a potential source of wood for the community, with no formal commitment from the Forestry Division. As noted in the section above that describes and analyzes project activities, the plantation would most probably be unable to provide for all wood needs of the community, and certainly not in the time originally programmed for the purpose (5 years from planting).

Besides the plantation the project is also engaged in

organizing the cultivation of a number of vegetables in community plots (The plots would in effect be divided into sections for each family). Although members of this community do have some experience in farming, that does not include a number of the items proposed by the project. On the other hand, this form of organization of individual/family responsibility upon parts of a larger community owned unit, is completely new to the group. Thus, the production system set in place by the project is highly experimental in social terms. There is no evidence to shed light on its opportunities for success, except for the relatively enthusiastic participation of members of the group in the clearing and ploughing of the land.

For the time being, fifteen to twenty families participate in project activities (out of a total of approximately sixty families in the community). An attempt is being made at fostering the organization of the group into a cooperative, thought of as a means to derive assistance from the central government and as a requisite to be awarded property or responsibility for the plantation and the agriculture plots.

II.3.1.2 The Palmiste fishermen:

This is a relatively small group among all the fishermen in the area; it consists of approximtely twelve to fifteen families (although they all are related to each other by kinship ties). Mostly east Indians, their principal activity is deep sea fishing, which they practice using large canoes and making daily trips to collect fish with nets; for lobster catch, they keep permanent cages underwater near their landing site and in the surrounding area. Besides these activities, members of the group take temporary employment in local companies seasonally, at times when the catch is low (or when it is restricted). At any rate, deep sea fishing seems to be the most consistent of their activities.

They reside at a site approximately a mile away, upland from the seashore. The principal obstacle this group saw for their economic stability, was the inadequacy of the installations of their landing site --lack of storage and marketing space. This became the short-term objective of the project for this community.

The project has been instrumental in providing them with an adequate site, and in helping them improve their organization (into a cooperative that is in the process of legal establishment) to gain access to land control and other external inputs.

In spite of their improved landing and storage conditions, the fishermen still face vandalism upon their permanent cages, a problem that they may solve with the

support of the project as well. However, their level of income seems to have been greatly enhanced by their improved control upon their landing and marketing site.

II.3.1.3 The seamoss growers:

This group cannot be identified as a community, but rather as elements of a number of communities, which are held together by their recent involvement in this activity. Therefore, they need no additional description than saying that they belong to both urban and rural areas in the region, having been identified more because of their individual entrepreneurial capabilities or personal interest in the project than by any social selection criteria.

At the moment there are seven groups (five to ten people each) working with their own funds (the project provided only initial financial support) at four sites along the coast. Since the area next to the shore is either under private ownership or is under the jurisdiction of the National Development Corporation, they negotiate in each case their right of access to the waterfront.

So far these groups have been successful in keeping their rafts with only minimal maintenance and vigilance required; no cases of vandalism have been recorded yet, although it is conceivable that this situation may change in the future if seamoss production is better known as a high income producing activity.

In general terms, all those participating in the project belong to communities that share in common two important characteristics: the first is diversification of sources of income, as a means to augment it and minimize risk; the second is their pattern of residence, separated from the site where the economic activities fostered by the project take place. Both these characteristics have importance for the discussion that follows.

II.3.2 Project Strategy:

The overall goal of the project consists of two mutually supportive parts: the first, to preserve the natural resources upon which the communities depend; and the second, to identify alternative income generating activities that could remain in the communities' hands and under their control.

In doing this, the project has followed these fundamental principles:

(a) respect the local multi-activity pattern of income genenation;
(b) establish good personal rapport with the communities in

order to instill in them the desire to assume an attitude of voluntary self-restraint from overuse of the natural resources upon which they have influence;

(c) assimilate and support local resource management and conservation practices whenever appropriate;

(d) follow the communities "timing" in the pursuit of the project activities, so as to minimize their dependence from external sources of initiative and control;

(e) remain as an accessible source of advice and help needed;

(f) emphasize for its public that the resources, in fact, belong to the communities and that the latter are responsible for their management and are the final beneficiaries or affected parties.

Great emphasis has been placed on providing the following services to the project beneficiaries:

(a) technical assistance in the selection and implementation of alternative productive activities;

(b) intermediation between the communities and local and national government agencies; and

(c) support for their organization into formal entities that would eventually be able to see to their own interests.

II.3.3 Local Constraints upon the Project:

There are a number of very significant socio-cultural and economic constraints that affect the project. The following seem most important:

(a) a very recent history of dependence upon external sources of power, initiative, funds, supervision, etc. that is connected to the colonial past of St. Lucia, a factor that has created a habit of expecting all these elements to come from outside the communities; thus, the achievement of spontaneous and consistent participation by the local people in projects that entail their assumming final responsibility for the resources being managed is a slow process;

(b) the precarious conditions that surround these communities' residence, income, access to credit or technical assistance; this factor makes the satisfaction of these very basic needs a first priority before attempting any further conservation or management objective;

(c) the lack of adequate legal means to formalize community organizations --the only three forms to create a citizens' institution are: by mandate of the Cabinet (which is difficult to get); by making it a not-for-profit organization (which does not suit this case); or by creating a cooperative (which is closely controlled by the government).

Another specific constraint that has a bearing upon project results is the fact that the participants have no direct control upon the resources being protected. For example, in the case of the mangrove, it is most probable that its unabated exploitation will continue in the future, either by the same charcoal producers group, or --if the latter eventually reach a full new source of charcoal via the plantations -- by other local groups that would occupy the niche left by that group when and if it relinquishes harvesting the mangrove.

The St. Lucia South East Coastal Resource Management Program shows great accomplishments at a small scale. It has been able, so far, to effect substantial improvements in the "beneficiaries" lives (in the case of the Palmiste fishermen, in particular -- or bears high potential to do so in the future -- with the seamoss growing project, and with the charcoal producers, if their income can be made more stable via the agriculture and plantation projects. The project faces a number of obstacles external to the project. Among them, two stand out as most important: the first, legal barriers to citizens' direct access to and responsibility over natural resources; the second, a combination of apathy and lack of experience in active community involvement in issues that pertain to the administration of the same resources. Regarding the first, the project has not done anything yet; however it would seem feasible, and project leaders agree on its necessity, to suggest adjustments to current legislation governing citizens' associations. Regarding the second, it will probably be only the constant work of this and other programs like this that would overcome this obstacle; for the time being, the ECNAMP project is doing its share in achieving the active involvement of the public it has sought.

II.4 Institutional Aspects

II.4.1 Institutional Framework:

INTERNATIONAL & REGIONAL ORGANIZATIONS	WWF + OTHERS			
	ECNAMP (Caribbean)			
LOCAL INSTITUTIONS	none			
	ECNAMP (St.Lucia)			
GOVERNMENT ORGANIZATIONS -Central Planning Unit	SOUTHEAST COASTAL RESOURCE MANAGEMENT PROGRAM			
	Maria Is. Reserve	Charcoal Producers	Palmiste Fishermen	Seamoss Producers
-National Trust -Forestry Division -Fisheries Division. -National Dev. Corp. -National Research & Development Foundat.				
COMMUNITY ORGANIZATIONS		Coop.	Coop.	Assoc.

The general structure that houses the project is shown in the above table.

The Eastern Caribbean Natural Area Management Program was created in 1977 through a grant from the Rockefeller Brothers Fund. It keeps offices in St. Croix, US Virgin Islands, St. Lucia, and Antigua, with its administrative and programmatic base in Barbados. ECNAMP's St. Lucia office runs the project being reviewed here.

The program coordinates its actions with a number of national governmental agencies:

(a) the Central Planning Unit, under whose auspices the program exists;
(b) the quasi-governmental National Trust of St. Lucia --in charge of the preservation of sites of historical and natural importance-- who is in charge of the protection of the Maria Islands Reserve, and who has been entrusted with responsibility over the piece of land used by the Palmiste Fishermen as a landing spot;
(c) the Forestry Division, which supports the plantation that would eventually become an alternative income generation source for the charcoal producers;

(d) the Fisheries Division, with whom the project is coordinating the seamoss project, and who provides support to the activities related to the fishermen at Palmiste;

(e) the National Development Corporation, who is responsible for most of the coastal lands, and who is allowing the plantation and agricultural activitites within its territory in support of the charcoal producers; and

(f) finally, the National Research and Development Foundation, a local NGO that will be explained in further detail below. The Project has been successful in achieving significant involvement of a number of public sector instituitions, whose support to the project is essential.

II.4.2 Profile of the Principal Implementing Body: ECNAMP St. Lucia:

ECNAMP (throughout the Caribbean) is a program; that is, a group of activities that correspond to specific goals, implemented by staff under contract to undertake those actions, the latter having a limited duration. ECNAMP St. Lucia is not a local organization, but rather an extension office of a regional Program.

This circumstance gives this project a very special character, from the institutional point of view. That is, a program is not, by definition, a permanent structure. In consequence, it is expected (and acknowledged from the part of project leaders, for that matter) that the project would eventually end (mention has been made of a 1989 tentative date) and all activities would cease. This particular fact does not need to have any significance for the evaluation of project achievements, but it does have relevance for the discussion of potential sustainability of the efforts created or fostered by the project. From the latter perspective, it is important to evaluate the need for continuation of those activities after the program pulls out of the scene, and, if that is the case, the necessity to identify a possible successor agency to undertake the task of supporting those activities.

This last point will probably need to be discussed in further detail once final evaluation of project achievements is done; for the time being, it can only be said that project leaders have been looking into possible local agencies to take over some supportive actions at the site, and that some suggestions are already in place. Following this line of thought, a short description of a candidate institution for such role is included further along in this section. Here, we will concentrate upon ECNAMP and its work philosophy, strategy and suitability to accomplish the tasks

provided for in project planning.

ECNAMP St. Lucia consists of a small staff: the Project Leader, the Scientific Advisor, two technical assistants, and a secretary. This small group is thought of as sufficient for the project by Project Leaders; in fact there is reluctance to charge the project with additional staff costs. Since ECNAMP is not an institution, it cannot hire the staff directly, so that those who are not employed by ECNAMP (regional office) are hired through local institutions (National Research and Development Foundation in this case) which receive the funds from the Program and proceed to make the payments through their regular payroll. This system has not caused any problems so far.

Perhaps the most interesting feature about ECNAMP is not its structure but its work philosophy and practice. In this respect a recent evaluation of ECNAMP as a whole (September 1985) provides all major elements to describe ECNAMP St.Lucia. Those elements are:

(a) an open-ended program objective --one that adapts itself to the current needs of the participants;
(b) non-targeted deadlines;
(c) non-formal, hands-on, learning-by-doing methods;
(d) consensus, rather than leadership, as the vehicle to decision-making;
(e) strongly participatory --bottom-up-- approach to decicion making.

ECNAMP St. Lucia conforms very closely to this description. In fact, a major criticism made by the previous evaluation also applies to it; namely: too open an agenda for the program tends to result in excessive attention given to the small projects and immediate problem solving, in relation to the time allotted to identification and analysis of resource management alternatives.

The risk of overextension is imminent in St. Lucia's project, as project leaders are already planning to initiate new activities --seamoss production is an example-- in other islands, while local activities have not really consolidated into viable, independent development options. On the other hand, there is strong pressure from the part of other local agencies, to seek the program's technical and financial support for additional actions; such is the case of the St. Lucia National Trust which has mentioned the need to "include in the program another site for protection". Both the temptation to delve into new development opportunities, and the fact that project leaders are among the most knowledgeable and best informed members of the community, make it ever more difficult to concentrate on a limited

number of activities. Such effort, however, may prove to be essential from the point of view of the Wildlands and Human Needs Program, as it must be able to undertake and conclude a given innovative project, reflect on it and derive conclusions that may illuminate its thinking.

As it relates to this abstraction task, in particular, project leaders in St. Lucia confess their limited capacity to devote time and energy to write about the project, or to take systematic account of its methodology, progress, problems and accomplishments.

Probably in compensation, the Program is well known and very prestigious in the Island. Its ability to mobilize public agency support is commendable; just as admirable is its patient and solid community work. Still a program though, ECNAMP may cease to be present as such in St. Lucia in the near future. A possible continuation of its work is sketched below.

II.4.3 Collaborator and Possible Successor Institution: National Research and Development Foundation:

The NRDF has two main work areas: (a) loans --at commercial rates-- for small individual or institutional projects; and (b) research and development activities. The first entails counseling and supervision, and tends to focus on non-traditional projects, which probably wouldn't be funded by a regular bank. The second does mostly contracted studies, and subcontracts when necessary.

The NRDF was founded in 1978 as the "Caribbean Research Center", only to become the NDRF in 1984. It is led by a Board of Directors (prominent local persons) and an Executive Diector. It has both Corporate (> EC$ 5,000) and individual (< EC$5,000) annual members.

Among its functions is the registration and reception of final reports for all scientific investigation being done in St. Lucia. The NRDF is currently leading the group of local experts in charge of the Country Environmental Profile, funded by USAID, and is also involved in making the National Conservation Strategy for St. Lucia.

Although it is premature to talk of a successor role after ECNAMP, the NRDF does seem an interesting avenue of future inquiry for the WWF.

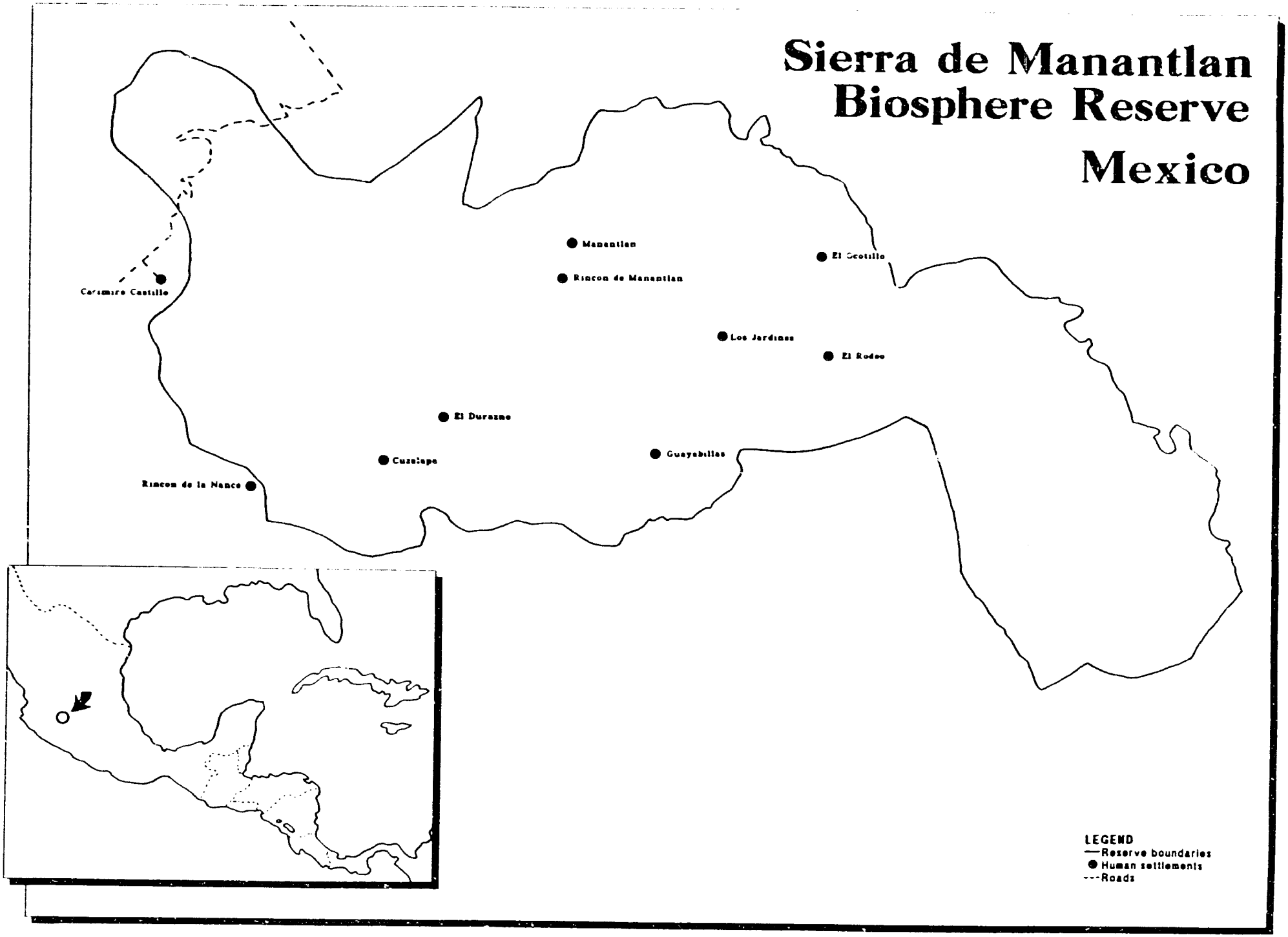
The project is clearly centered around the personal philosophy and style of the project leaders; more importantly, such strategy is not spelled out in any document or by any other means as an institutional methodology. It follows that, if the project leaders leave: (a) there would

not be a path established for the next project implementors; (b) not enough effort has been made at systematically recording project actions, tactics, responses to outside influences, etc.; Project leaders have expressed their intention to reflect at least partially the contents of the experience in the education/training materials to be designed during this coming year; so far, this lack is a significant constraint to project appraisal, let alone replicability.

Although project leaders had reportedly expected to assume, at some point, the task of drawing specific resource (or site) management plans, they have later changed their minds. It is seen now as preferable to devote all efforts to empowering the community to take responsibility for the resources on which they depend, so that they can reach improved management on their own. While this choice is consistent with the "process" orientation ascribed to the project, it entails great risk unless additional (and untimed, unprogrammable) technical assistance is provided. The open-ended nature of this approach to management, while it can be implemented under a permanent agency structure, and it could, perhaps, be feasible under a long-term program structure, is not practical for a project-type entity.

Sierra de Manantlan Biosphere Reserve

Mexico



III. SIERRA DE MANANTLAN, MEXICO

III.1 Site Description

III.1.1 General:

The Sierra de Manantlan is located in the States of Jalisco and Colima, Mexico, 50 kilometers north of the Pacific port of Manzanillo. The axis of the Sierra runs from west by north to east by south for a distance of more than 60 kilometers. Terrain tends to be extremely rugged and broken, with steep slopes and ravines occasionally interspersed with wider valleys and flats. Altitude ranges from a few hundred meters to 2900 meters above sea level.

III.1.2 Genetic Resources and Biological Diversity:

The Sierra de Manantlan has attained world fame as the home of the wild ancestor of corn, Zea diploperennis. Additionally, the site exhibits high numbers of species of many plants and animals, fungi and hummingbirds, for example. It also contains some very primitive species, several temperate zone species that reach their southern limit of distribution, and several tropical species that reach their northern limit of distribution. Factors that contribute to the high diversity include:

- geographic location on the mainland near the Tropic of Cancer;
- large altitudinal changes over short horizontal distances;
- exposure to moisture from the nearby Pacific which make the area relatively moist and did so, also, during the Pleistocene period.

III.1.3 Natural Resources:

Much of the Sierra de Manantlan is forested. Low elevations exhibit subtropical dry forest. As one goes higher, and conditions become moister, one finds oak forest, oak-pine forest, temperate moist or, mesophilous, forest, and cloud forest. The gradation is not strictly vertical, but also varies horizontally with moisture availability. At mid elevations, moist forest typically occur in ravines and oak-pine and pine forests grow on ridges.

The forests support a variety of wildlife including several species that have commercial or subsistence value. Hunting occurs but game species, including deer and peccary survive, as do their predators, even the endangered jaguar.

Rainfall in the Sierra de Manantlan varies from 900 mm to 1800 mm, tending to increase with altitude, and higher on the windward side of the range than on the leeward side.

Precipitation gives rise to numerous streams, which, in turn, feed several major rivers that flow through agricultural valleys surrounding the range. In some instances, streams which are permanent near their sources dry up lower downslope during the dry season. From the point of view of downstream users who depend on it for domestic, agricultural, and industrial use, water probably constitutes the Sierra de Manantlan's most important resource.

III.1.4 Land Use:

Agriculture: Permanent agriculture occurs on flat land and better soils at low and medium evaluations. Corn is the principal crop, but sugarcane is also important in the lower valleys. On the middle and upper slopes, small farmers cultivate corn in rotation with bush fallow and also keep orchards. Agriculture becomes less common on the higher slopes.

Grazing: Grazing, primarily of cattle but also of goats, occurs throughout the Sierra de Manantlan at all elevations. Animals range at will through the various types of forest, grazing on ground cover and understory plants. Fences exist but they seem to demarcate boundaries rather than contain livestock.

Logging: Virtually all of the Sierra de Manantlan has been logged, largely for pine, but also for the preferred moist forest species like magnolia, and for some oak. Logging trails scar the slopes where they erode rapidly until vegetative cover can reestablish itself. In most places the forest has regenerated, however; dense patches of pine saplings are particularly noticeable.

Fire: Fire occurs throughout the Sierra de Manantlan. Its effects are particularly noticeable in the pine forest where it scars, and sometimes kills, the trees. But fire does have some beneficial effects. It encourages growth of fresh grass and herbs for cattle; it clears brush from hillside corn fields; it may assist germination of some pine seeds and it probably favors pine regeneration over establishment of moist forest.

III.1.5 Natural Resource Management:

Most of the aforementioned land uses are not compatible with each other; nor are they compatible with the water production and regulation capacity of Sierra de Manantlan. The Laboratorio Natural Las Joyas has identified uncontrolled grazing as the most damaging land use, followed by indiscriminate fire. The Laboratorio would propose complete elimination of grazing or restricting it, by fencing, to the gentler slopes with limitation of the number of animals so as not to exceed carrying capacity. Too many animals on too

steep slopes reduce groundcover and compact soil, thereby provoking excessive water runoff with attendant erosion. The animals also interfere with forest regeneration and probably affect the composition of second growth forests.

Fire should be contained in the Sierra de Manantlan, though its controlled use in agriculture and silviculture may be appropriate. Logging should also be controlled by reducing the number of skid trails, using appropriate extraction technology, and leaving the steepest slopes unharvested.

III.1.6 Protected Area:

Presidential Decree of March 5, 1987 created the Sierra de Manantlan Biosphere Reserve with an area of nearly 140,000 hectares. The Reserve contains all of the vegetation formations mentioned above, except subtropical dry forest. It also supports all of the land uses noted above.

The project area includes all of the Biosphere Reserve as well as various "ejidos" with land outside the Reserve. The Laboratorio Natural Las Joyas owns a parcel of 1250 hectares in the middle of the Reserve which it plans to use as a research site as well as to form part of one of the nuclear zones of the Reserve. Thirty ejidos and nearly 80 individual owners own land within the Reserve.

The Laboratorio, which has responsibility for managing the reserve under an agreement with SEDUE, proposes three use classes for land in the Reserve: nuclear zones, recovery zones, and buffer zones. Conservation would constitute the principal land use in nuclear and recovery zones, whereas buffer zones would allow more of other uses.

III.2 Project Description and Analysis

III.2.1 General:

The Laboratorio Natural Las Joyas is a division of the University of Guadalajara. In the three years it has existed it has grown rapidly until now it has a staff of 90 people. It began with one vehicle, currently has six, and expects to increase to twelve in the near future. The staff no longer fits in its headquarters, a converted house in a residential district of Guadalajara. Its field offices in towns near the Reserve and at Las Joyas in the Reserve, are likewise too small. The Laboratorio plans to move its headquarters this year to an adequate building in El Grullo near the Reserve and to continue expanding its infrastructure at Las Joyas.

The large staff and complex infrastructure support an equally complex set of project activities. These have been designed systematically to flow into each other, with

research as the central activity that connects to the others: development projects, education, planning and public information.

III.2.2 Research:

Basic inventories constitute one major branch of research at Manantlan. These include a series of maps, which have already been completed, that show the results of geologic, soil, and vegetation surveys. Toxonomic studies of flora and fauna have begun but will take some time to complete. The same is true of the forest inventory that will give rise to information for forest management.

Another branch of research includes ecological studies of selected animals and plants. Most notable among these is the work with Zea diploperennis, both in wild populations and in controlled experiments with plants grown from seed and from rhizomes.

III.2.3 Education:

Much of the education component of the project connects directly and formally with the research component. Many of the members of the staff are university students, mostly undergraduates but some graduate students, who conduct research for their theses. In addition to studying their specific research topic, they benefit from contact with their colleagues in other disciplines.

The Laboratorio also engages in special education programs for school children. For three consecutive years it has organized and operated a program at the Reserve for children from Guadalajara and from communities near the Reserve. The children are exposed to basic ecology and environmental science. As a second phase, the rural children visit Guadalajara where they stay in the homes of city children and are exposed to urban life and the study of urban problems.

A third aspect of the education component involves the communities in and near the Reserve and consists mostly of informal sharing of information, though some of the development activities noted below entail formal training.

III.2.4 Development Activities:

The Laboratorio's work in development has intentionally lagged behind initial research as the project's attitude has been to learn as much as possible about the Reserve's resources before attempting development. Only a few development activities have actually begun and these have only been going for a few months. These include a community health program and a citrus growing project in Cuzalapa.

Eventually the Laboratorio expects to foster development projects in controlled logging by "ejidos" (communities), who own timber rights but heretofore have sold them to outside logging companies, and controlled grazing by landowners whose property falls partly or entirely within the Reserve.

III.2.5 Planning and Management:

Thus far the Laboratorio has worked under annual operational plans and has deferred long term planning. Now, however, a management plan has begun which will set out long term uses and development for the Reserve's thre zones and specific site activities.

Planning envisions management, and management entails coordination. Given the large number of different land holdings in the Reserve, the different objectives of the owners and the different capacities of the land, coordination appears difficult and complex. Nonetheless, the Laboratorio must achieve coordination in order to realize its conservation goals and continue its research and education program. The Laboratorio acknowledges this but does not yet have a clear strategy to accomplish it.

III.2.6 Public Information:

From the beginning, the Laboratorio has placed high value on public information. Its leaders are scientists who publish the results of their work and know the importance of that. They also believe the public at large should know about Manantlan. Toward the end of public information, they have prepared several popular publications as well as more purely publicity items like address books. All of these share a very attractive presentation which encourages people to read them and learn the information they contain.

III.3 Social Aspects

III.3.1 Relationship of Communities to the Reserve:

The boundaries of the Sierra de Manantlan Biophere Reserve (SMBR) were purposely established to avoid the area directly affected by the local communities. The latter have been left outside its limits, except for a few houses at the La Joya Research Station (LJRS) site where a couple of family units live in collaboration with the project. A number of communities are located at the Reserve's perimeter. Before 1980, a great number of local settlers held, as a principal income producing activity, the provision of wood for a few sawmills. The sawmills were later evicted by the combined pressure of the Reserve, and the communities who sought direct control over the timber resource. Currently, the surrounding communites are mainly devoted to agriculture; cattle raising--which are left to roam free into the Reserve

during the dry season; and lumbering for consumption and sale.

Agriculture is practiced in the neighboring valleys and affects the reserve only slightly. Cattle roaming does exert some pressure upon natural vegetation at the Reserve but, unless irrigated pasture land is provided, the need for natural forage will be present. Lumbering is also a difficult problem to tackle. Natural forests are by far the main source of wood for construction and sale; some local groups, who oppose the Reserve, have been lobbying within the communities to gain support for rights of use to the Reserve's pine forests. Other groups however, back up the Reserve and resent the logging attempts by some sectors of the communities. The presence of this internal conflict was evident at Cuzalapa, the community that was visited and whose members were interviewed in detail. A number of conflicts of a similar nature are said to exist among the rest of the communities; in some, local support for the reserve is less than in Cuzalapa.

III.3.2 Factors Affecting Community Relations:

A number of factors have bearing upon the degree of support the communities provide the Reserve with. One is the awareness of the vital ecological functions the natural vegetation cover serves for the maintenace of a healthy water cycle; absence or over abundance of water are events local people are keenly aware of and, to the extent that the project can establish a clear relationship between the Reserve and those events, local support would be achieved.

A second factor is the nature of the land tenure system in the region. The great majority of land is in private property; 73% of the land in the project's area of influence belongs to the "ejidos" (mestizo communities) and "comunas" (indigenous groups). Another 23% belongs to private landholders; and only 4% belongs to the state of Jalisco -- basically the Las Joyas research station and its surroundings, were the Zea diploperennis grows and where experimental plots are held. On private lands, recommended resource management patterns are difficult to impose unless the communites are provided with conservation or alternative income generation opportunities. To the extent that the reserve can regulate but maintain community access to the resources, such would be a preferred option to monopolistic control by interests from outside.

A third factor is the effectiveness of project promotion and education activities directed toward the communities. Here, the project's impact is still incipient. Although both the education and public relations departments of the Laboratorio are thought of as having some direct responsibility for the involvement of local communities in

support of the project, neither has been able to assume a significant role in this respect yet. Existing public relations activities tend to engage small and highly specialized groups, while education activities are addressing much broader publics outside the Reserve's area in an effort to gather public and political support for the project.

III.3.3 Role of the Laboratorio in Community Relations:

Thus, in practice, some of the research people, and particularly the staff person in charge of the eco-development projects are the ones to keep closer contact with the communities. Two services are being offered by the research staff: legal advice and training workshops on alternative medicine (homeopathic medicine) for small groups of women. The eco-development program is still in the process of defining its scope of work and projects and, at the time of the evaluation, had had only preparatory meetings with community members.

In spite of the breadth and appropriateness of all the activities, it remains clear that the project does not have a strong presence among the local communities, and thus it is failing to gather adequate support from them or provide the necessary guidance to their activities. The root of the problem would not seem to be at the conceptual level. Here, the project has expressed a clear strategy for community work and involvement:

(a) intensify use of the lowlands in order to release pressure upon the protected highlands;
(b) promote forest harvesting by the communities themselves;
(c) identify income earning activities to replace ecologically damaging practices.

While pursuing communities' benefits, this strategy does not spell out a communications plan that would allow the strategy to be accepted and undertaken by those communities. This would seem to be where the problem lies. The project lacks the professional capability (sociologists, anthropologists) to put a sound community development program together.

This lack of presence and concerted action at the community level was evident during the visit paid to Cuzalapa (which is apparently one of the strategic linkages the project has achieved in the area). Some sectors of the community were able to argue successfully that they hadn't heard officially and consistently about the project or from its staff. It was clear that project contacts remained at the individual or sector levels, not having reached recognition from the group as a whole.

Out of the three factors mentioned here (awareness of the Reserve's ecological value, land tenure and community development work), the last one would seem the most important: the one which could open the way to improve community awareness and achieve their cooperation under current land tenure systems; the one area upon which the project may have greatest and most controlled impact. It is thus apparent that the project would need to expand and improve this area as a high priority for the near future.

A second step would be the promotion of community organization options, as a means to facilitate the adoption of the project's strategy, and to strengthen the sectors that currently support the Reserve, assigning them responsibility for its protection.

III.4 Institutional Aspects

III.4.1 Background and Objectives:

The Laboratorio Natural Las Joyas (LNLJ) is the local institution in charge of project implementation as concerns WWF's funding for the "Sierra de Manantlan Biosphere Reserve". The latter is administered by the Secretariat for Urban Development and Ecology (SEDUE).

The Laboratorio was established in May, 1985 within the University of Guadalajara, as a result of the discovery of Zea diploperennis (perennial maize) at Las Joyas. Its original intention was to undertake scientific research on the site. Such initial objective was later expanded to cover the establishment of the Biosphere Reserve and short term planning and research in support of the Reserve's administration and management. Thus, the LNLJ has become an important source of support for the Reserve.

Today, the Laboratorio's specific objectives include:

(a) research on resource use, potential, value, characteristics, and technological options; collection of information; socio-cultural research;
(b) ecodevelopment: basic infrastructure, community work experiments on productive enterprises;
(c) education;
(d) public relations and coordination with local groups.

III.4.2 Institutional Structure:

In order to fulfill its objectives the LNLJ has organized itself into program areas -- one corresponding to each objective -- , each responsible for specific actions and headed by one coordinator. By far the strongest of these areas is the research unit, where most staff is assigned and where most projects are taking place -- flora, fauna,

ethnoecology, Zea diploperennis, etc. All other programs play a supporting role to the research unit: administration, information, education, public relations.

This organization reflects clearly the institutional rationale behind LNLJ: it is an academic research entity manned by university research professionals for whom research is the basic objective of the Reserve and the ideal institutional arrangement for its administration is in the hands of an academic entity.

It is important to note that Mr. Rafael Guzman, the Mexican scientist who discovered Zea diploperennis, heads the LNLJ. To a great extent because of his prestige and the international support his work has attracted, LNLJ is as well staffed as it is. LNLJ has grown from 3 to 90 people in two years; and from a handful of small, pinpointed research projects it has assumed responsibility for a great number of large-scale projects.

Possibly, excessive attention is being placed upon basic research. Its role toward the area would be enhanced if the LNLJ strengthens its management and its applied research capability. LNLJ would seem to be moving toward that direction by planning on improving and enlarging the role of the eco-development unit. However, given the lack of internal experience in the field, some guidance might be necessary -- in the hiring of new staff, development of programs and projects, and monitoring, reporting and coordinating functions.

LNLJ's staff would seem to be extremely committed and hardworking; they are no doubt a great asset to the project. Certain additions -- as it is commented upon above in the social aspects section of this chapter -- would be valuable to create a full multidisciplinary team work capability. On the other hand, the emphasis on individual research projects as the basis for the institution's organizational arrangement has created a pattern of atomization and dispersion. In other words, each person is a program, each program a research project; each could work separately, if necessary. No well developed coordination model is in place. This is an area that needs improvement.

III.4.3 Financial Support:

In promoting and sustaining LNLJ's growth, the University of Guadalajara (UG) has been crucial. The University covers salary expense (LNLJ's staff is formally hired by UG), equipment and administrative costs. The University controls the LNLJ administratively and, through its research coordination unit, orients and supervises LNLJ's research work. Clearly, LNLJ's stability depends upon the support it obtains from the directives of the University of

Guadalajara.

Other contributing institutions include the WWF (which is reported to cover approximately 25% of general operating costs - although with funds targeted to specific projects); and The Nature Conservancy, which is funding research on Zea diploperennis for 1987. The assistance of Conservation International is being sought for the future.

As concerns the project's need for financial support, its director has expressed his concern for the project's probable inability to meet an objective it had when it was started: that is, to request significant external support at the beginning and to decrease its dependence upon those sources gradually later on. So far, the project director thinks it is unrealistic to expect the project to take off on its own. A long-term problem in this respect are its high operating costs. No strategy is in place yet to reduce those costs or secure additional local funding for the purpose. Dependence on external funding would seem, then, an inevitable fact at the short, medium and, perhaps, even the long term.

III.4.4 Relations with Other Institutions:

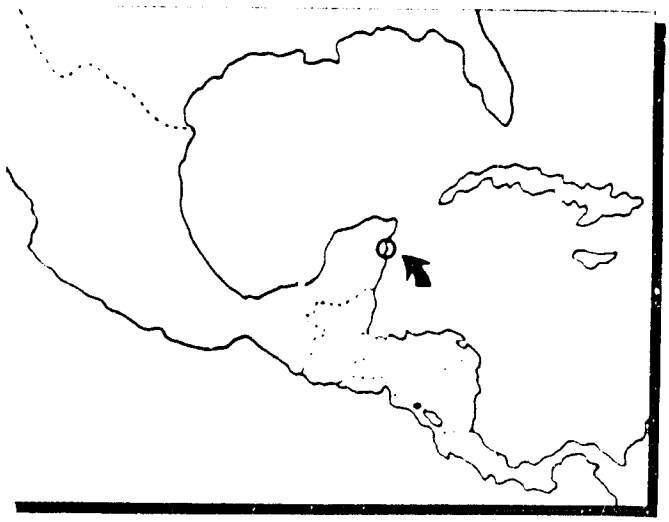
On this same subject, the LNLJ engaged itself in what would seem to be a sound institutional strategy: supporting and coordinating the establishment of a non-governmental organization, "BIOJACO" in 1986. Although independent from LNLJ, Biojaco was promoted by the LNLJ's founders and was supported by LNLJ as a means to diversify and increase external support to Sierra de Manantlan. While the idea seems excellent, practice has not followed through. There is a certain degree of tension between LNLJ and Biojaco, basically because of a problem of accountability. In short, LNLJ does not have a means to ensure that all funds labelled for Sierra de Manantlan are in fact received by LNLJ.

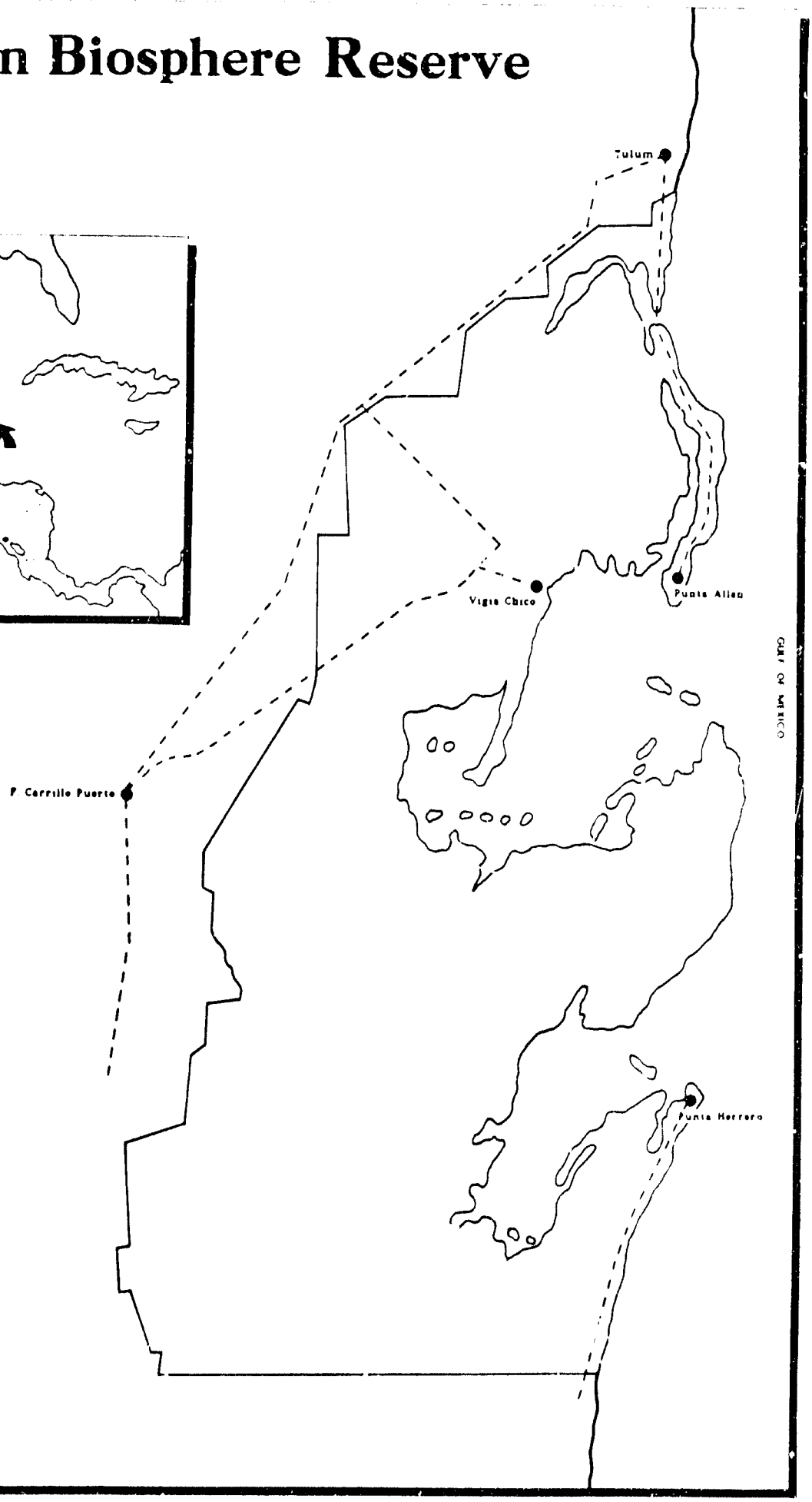
In summary, inter-institutional coordination is a rather weak link for the LNLJ. Its NGO connection is not working as expected; it holds subtle but important friction points with some central governmental units -- like the Secretariats for Urban Development and Ecology, Agriculture and Hydrological Resources, Agrarian Reform -- units that typically act less efficiently that the LNLJ, and lack its committment to excellence in research.

Perhaps its relationship with WWF is the best fit so far; the Fund has been commended for its openness and flexibility. However, the fact that the Fund does not allow use of funds for overhead presents some problems to the local institutions. At times a given project would have enough funds, but the whole Laboratorio would lack basic operating money and may suffer serious delays in project implementation

or use part of the funded project capabilty to compensate other project area needs.

Sian Ka'an Biosphere Reserve
Mexico





IV. SIAN KA'AN BIOSPHERE RESERVE, MEXICO

IV.1 Site Description

IV.1.1 General:

Sian Ka'an is located on the Yucatan Penninsula in the Mexican state of Quintana Roo. It lies just south of Tulum, a major Mayan archeological site, about 150 km south of Cancun. The entire site is flat, attaining maximum elevations of only a few meters above sea level. The geological substrate of the area is recent, calcareous rock. The rock is highly permeable, so there are few surface streams, but apparently numerous subterranean aquifers. Soils tend to be very thin. Rainfall is reasonably high, but the pronounced dry season, from January to May, and dry rock and soil conditions, reduce moisture availability. The second longest barrier reef in the world follows the eastern shore of the Yucatan Penninsula, separating Sian Ka'an from the high sea.

IV.1.2 Natural Resources:

Vegetation: Sian Ka'an contains several distinct vegetation types. Subtropical moist forest occurs on the best sites with relatively deep soil where it attains moderate height. This forest is most common inland but also arises on high ground toward the coast. Shorter, less diverse forest occurs on drier, rockier sites and those that are seasonally flooded with rain water. Areas permanently inundated with fresh water support marsh grasses and mangroves occur in association with fresh water and salt water. Extensive sea grass beds abound in the salt water lagoons and the fresh water lagoons support considerable vegetation also. Some forest harvesting occurs. In the past most of the mahogany has been selectively logged from Sian Ka'an as has some cedar and other valuable woods. One species of palm, known locally as "chit", which is particularly valued for construction and for roofing, has become scarce in certain locations.

Water: Extensive surface water occurs at Sian Ka'an at and near sea level. Deep, open ocean extends beyond the barrier reef that fringes the coast. Between the reef and the coast, lagoons merge inland into broad bays edged with mangrove. Further inland, fresh water lakes empty into the salt lagoons. All of the lakes, bays and lagoons tend to be shallow, rarely reaching depths of four meters or more. In addition to these large bodies of water, small fresh water holes, or "cenotes", occur fairly frequently in higher ground.

Fauna: The diverse terrestrial, aquatic and marine

habitats support a correspondingly diverse fauna. The most visible are birds which abound in large numbers of many species. Terrestrial fauna has been little disturbed and, although some hunting occurs, all the wild cats native to the area still exist as do all the animals lower in the food chain. The same is true of aquatic and marine fauna. Crocodiles were hunted until recently but their population survived and now appears to be increasing. Fishermen catch spiny lobsters in abundance but populations remain reasonably high.

IV.1.3 Archeological and Anthropological Resources:

Sian Ka'an, whose name in Mayan translates approxiamately as "the source of the sky", has long been home to the Maya. They still live here, conserving their language and customs, though modernization of Quintana Roo now brings them in constant contact with the Spanish language and general Mexican culture.

In past centuries the Maya built numerous stone works in and around Sian Ka'an. These have considerable archeological value though many have not been studied well yet. It is also believed that some of the canals which connect fresh water lakes to salt water lagoons may have been built by the Maya.

IV.1.4 Infrastructure:

A main highway runs along the coast form Cancun to Tulum at the north end of Sian Ka'an. From Tulum an unpaved road follows the coast south to Punta Allen. The main highway bears inland, through the large town of Carillo Puerto to Chetumal, the capital of Quintana Roo. From Carillo Puerto an unpaved road enters Sian Ka'an and runs eastward to a point about two kilometers across the lagoon from Punta Allen. South of Carillo Puerto another unpaved road connects to the coast a little south of Punta Herrero.

Electricity generally extends throughout the area but some remote families do not have service. Water comes from wells; Punta Allen, for example, receiving pumped water from a well about 20 kilometers inland.

IV.1.5 Land and Resource Use:

Not many people live in Sian Ka'an. Those who do tend to congregate in the several towns. Along the coast, most people, concentrated in Punta Allen and Punta Herrero, make their living from fishing for spiny lobsters. A few people raise coconuts for copra but in the last few years a disease has infected the trees and production has fallen drastically. There is also some small scale, relatively rustic, tourism but, thus far, no massive tourism development.

Inland, there is considerable forest clearing close to the main road for home sites, roadside businesses, small farms, and some cattle grazing. Eastward of the road in Sian Ka'an, very little land has been completly cleared. There are a few small farms and one fairly large cattle ranch (400 hectares) which has been cleared but appears to be reverting to second growth forest. Selective logging, mostly for railroad ties, continues in Sian Ka'an on a relatively small scale.

IV.1.6 Protected Area:

The Sian Ka'an Biosphere Reserve was created in 1986 by Presidential Decree. It covers 528,000 hectares which include substantial areas of all the vegetation types and aquatic and marine habitats noted above.

IV.2 Project Description and Analysis

IV.2.1 Baseline Studies:

A series of baseline studies for the Sian Ka'an Biosphere Reserve were performed prior to the formalization of the Reserve and published by CIQRO, Centro de Investigaciones de Quintana Roo, in 1983. Since formalization of the Reserve, Amigos de Sian Ka'an, a non governmental, non profit organization has entered into a three part program that includes development and management projects for the reserve and surrounding communities, publicity and fundraising.

IV.2.2 Development and Management Projects:

Three development projects, all with support from the World Wildlife Fund, focus on the needs of the spiny lobster fisherman at Punta Allen.

Spiny Lobster Biology: The spiny lobster biolology project is carried out by the UNAM, Universidad Nacional Autonama de Mexico, Marine Sciences Research Center in Puerto Morelos as part of a larger program of research in physical and biological marine resources of Mexico's Caribbean coast. The study seeks to determine more information about life cycles, growth rates, and migration of spiny lobsters. After two years of research UNAM expects to have enough information to advise lobster fishermen on such things as fishing areas, closed seasons, size restrictions and catch restrictions.

Palm Studies: Amigos de Sian Ka'an carries out research directly on three species of palm: chit, another species used for construction and roofing, and one ornamental with commercial possibilities. The fishermen at Punta Allen traditionally use chit to make lobster traps. In

collaboration with the palm study, they will suspend use of chit for two years. In the interim, they have accepted ferrocement as a substitute building material for the traps. The study, upon completion after two years, should show growth rates for leaves and stems of chit and phenology and density of the ornamental palm. The results of the chit study will enable management planning for sustained yield harvesting.

Intensive Irrigated Agriculture: At a place called Ramonal, 30 km or so inland from Punta Allen, Amigos de Sian Ka'an has established a demonstration farm. The farm produces vegetables, fruits and corn in large quantities from an area of less than a hectare using advanced technology consisting of: a drip irrigation system made of plastic pipe; an electric pump that taps a shallow well and supplies water to the irrigation system; application of various pesticides in complex timing schedules, to control insects; composting and reincorporation of weeds to maintain organic matter levels.

The system cost about US $2,000 to set up. Two laborers live at the site and operate it and an agricultural technologist spends about half-time keeping it fine-tuned.

Products from the Ramonal project are sold in Punta Allen. Initially the fishermen in Punta Allen had expressed interest in starting farms in the Ramonal area using the methods demonstrated by the Ramonal project. Thus far only two fishermen have done so. Nonetheless, Amigos de Sian Ka'an considers the project successful from an environmental point of view in that, as an alternative to deforestation, it has probably dissuaded some people from clearing large, low intensity farms.

IV.2.3 Wildlife Projects at Chunyaxche:

The Ejido of Chunyaxche, a Maya community southwest of Tulum, holds extensive tracts inside the Reserve and even more land outside and to the west of the Reserve. Amigos de Sian Ka'an has built a small information and demonstration center there near which it also has started three small scale wildlife management projects: with crocodiles, butterflies, and deer. Additionally, INAH, Institute Nacional de Arqueologia e Historia, has cleared and begun to study several Mayan ruins near Chunyaxche.

The general objective of all three wildlife projects is to demonstrate family scale management techniques at reasonable costs. The deer project has not really begun yet, and not all of its specific objectives are clear, but it builds on the observation that some local families keep semi-tame deer in captivity at their homes.

The butterfly project aims to collect butterflies and use them in locally made arts and crafts, although there is no tradition of such use, and also sell them on the international collectors market. The project has devised an ingenious way to collect the butterflies. Project technicians look for plants whose leaves have had butterfly eggs laid on them. They fasten a net bag around these plants in the expectation that the eggs will hatch, caterpillers will grow and pupate, and butterflies will emerge in the sacks. The technique has not been in use long enough yet to show results.

The crocodile project has advanced a little further than the other two. It uses an animal of known commercial value in the area. The project has built small concrete hatching sites for eggs and covered rearing pens for young crocodiles. It also has two mature crocodiles under observation in large enclosures in the freshwater lagoon near Chunyaxche. The purpose of the project is to demonstrate that a family can rear crocodiles easily and inexpensively. (The project's hatching and rearing pens cost US $2,000 to build with concrete, chain link fence wire, and local roofing materials.)

The crocodile that the project uses, Crocodylus Moreletii, is endemic to Yucatan and on the CITES list of endangered animals whose products are proscribed from trade. Although Mexico has not signed CITES, Amigos de Sian Ka'an intend to honor it. This means the skins of the animals it raises cannot be marketed except under a CITES exeption for products from controlled rearing sites.

IV.2.4 Ecotourism:

Amigos de Sian Ka'an expects to begin a project in ecotourism soon. Most of the resort owners on the coast between Tulum and Punta Allen belong to Amigos de Sian Ka'an, support its goals and, reportedly, would limit their own tourism activities to those compatible with the conservation goals of the Reserve. Land near the Reserve is available for tourism develpment, however, and Amigos de Sian Ka'an advocate that any development not conflict with the Reserve. They note that no environmental or naturalist tourism actvities exist in or anywhere near the Reserve. The ecotourism project intends to develop such activites in and near the reserve, probably beginning with the existing small resorts on the coast and at Chunyaxche.

IV.2.5 Publicity:

Another incipient Amigos de Sian Ka'an Project deals with publicizing the Reserve and its attractions. The first few of a series of brochures have been printed and more are planned to follow.

IV.3 Social Aspects

IV.3.1 Social Groups at Sian Ka'an:

There are three kinds of human conglomerates that are affected by and affect the Sian Ka'an Reserve. The first are the people who live from the resources protected by the Reserve, fishermen who had settlements along the coast around which the Reserve's limits were established. These fishermen harvest lobster and are located in Punta Allen and Punta Herrero. They would presumably also inhabit (although temporarily only) the El Ramonal area, where the experimental farm is.

A second group is made of fishermen inhabiting other areas (principally Cozumel Island) who fish within reserved waters, but have much less contact with the project than the first group.

The third and last group includes the neighboring "ejidos" (like Chunyzache, which has approximately 500 mestizo families and controls an area of 110,000 hectares), and the "comunas" (indigenous communities). These surround the Reserve and contitute a potential threat to its fauna and forest resources, given the lack of clear and controllable boundaries between their territories and that of the Reserve.

Out of these three, the first bears most interest for this evaluation due to their current and potential impact upon the protected resources and due to their present contact with the project.

IV.3.2 Collaboration with the Fishermen:

There are approximately 500 people in Punta Allen, and less than 40 fishermen in seasonal settlement at Punta Herrero. Their ethnic composition is primarily Mayan, with a longstanding background in fishing. Lobster became their main and, later, only catch when the rise of tourism is Cancun and the growing demand abroad pushed for production for export.

At these communities, particularly at Punta Allen, there is a sophisticated organization in place for the explotation of the lobster. At Punta Allen, all fishermen belong to a cooperative, which regulates size and means of catch, compliance to regulations and coordination with the Reserve. New membership in the cooperative is highly restricted, while ousting can be motivated by failure to obey any of its regulations. The close control exerted by the coop has been crucial to having the fishermen adopt a collaborative role toward the ends pursued by the Reserve. In fact, as long as new competititon for the resource is

deterred by the establishement of the Reserve, and as long as current dwellers in the area are allowed to stay, the Reserve contributes to those communities' ends.

There is, then a positive attitude toward the Reserve on the part of the lobster fishermen. Such attitude, however, is tempered by the restriction in land tenure options the Reserve entails and the potential risk of more stringent controls on their catch if the situation with the lobster populations changes. With all its advantages, the Reserve is still an imposition on their freedom; concern for this fact is not lacking.

IV.3.3 Problematic Aspects of the Social Situation:

At the moment, a balance in the relations Reserve-communities has been reached, through the provision of two services: research on the resource --which is seen as highly beneficial for the fishermen's own sake-- and a compromise between the fishermen's want of land to farm and the establishment of small experimental plots where enough produce for consumption would be harvested. These experimental plots are the "El Ramonal" component of the project, and entail intensive irrigated farming. The fishermen were to be the ones to assume farming and the project would provide the initiative, technology and technical assistance.

However, a short look at the conditions prevailing at the farm plot renders it evident that the fishermen would hardly want to sacrifice their rather comfortable habitation places at the beach, where they make enough income during the harvesting season to live year-round and save, to move into these plots during part of the year. If anyone, elder members of the group or other relatives of the fishermen would be the ones to move to the Ramonal area, creating, then, a new focus of expansion of population within the Reserve.

Amigos de Sian Ka'an funded (with Program funds) the experimental plot and have offered plots to some 25 or 27 members of the fishermen cooperative. It would seem, however, that the only benefit of the Ramonal component would be the satisfaction of the fishermen's desire for land, a desire that does not seem to be backed by a true intention of becoming farmers themselves but rather as a means to invest in activities additional to fishing and particularly in land.

Amigos de Sian Ka'an are planning on requesting additional funding to continue the operation of the experimental plot. However, external funding may not be appropriate in a situation where the project beneficiaries make between US$ 25,000 and US$ 35,000 a year, and where there is no tradition of farming among the community. The

fishermen may be in a position to invest in the plot if they actually plan on pursuing the effort as opposed to speculating with the land or providing some expansion room for their families by bypassing the restrictions set by the Reserve. Amigos de Sian Ka'an shouldn't be caught in fulfilling a need that may not exist.

Thus the situation with the local communities neighboring the Reserve is one of negotitated peace at the moment. Amigos have been instrumental in achieving such state, although it seems to be assuming responsibilities beyond what wise counsel might advise: at the time, they are also "invading" reserved land with their experimental plot, as no legal tenure right has been awarded for it. If Amigos de Sian Ka'an do get a land use permit, other claimants would also be warranted in their request for land; such would be an undesirable outcome.

Perhaps it would be best to move away from farming and concentrate efforts on the management of the lobster, getting the fishermen to contribute to the preservation of the Reserve financially and otherwise.

IV.3.4 Additional Observations:

A final point regarding the fishermen has to do with the recent initiation of a research program on lobster by CIQRO in cooperation with Earthwatch. The program is aimed at conducting research on populations, migrations, habits, etc. of the lobster, through the participation of expatriate volunteers (usually inexperienced ones). While the fishermen seem to have been contacted (not to request their permission to enter the area, but to get their logistic support), no efforts have been made at coordinating with Amigos de Sian Ka'an or the Autonomous University of Mexico (UNAM).

The presence of a large scale touristic/scientific project may be disturbing for the lobster populations, and will surely be disrupting for the community work Amigos de Sian Ka'an have initiated. It is important that Amigos face this problem as soon as possible instead of ignoring it as seems to be their current strategy.

As refers to the other two groups --out-of-the-area fishermen and neighboring farmers-- the project has had only limited action toward them; in the future, environmental education activities would probably address these groups. Amigos de Sian Ka'ans' work in this area is still at an early stage.

IV.3.5 Synopsis and Recommendations:

In summary, internal conditions for community involvement in the Reserve's protection are optimal. There

has been some improvisation in the project's response to local pressure that may be a consequence of the absence of staff trained in social and economic sciences, or simply of lack of experience.

Given Amigos de Sian Ka'ans' willingness to engage in new and expanding projects, it is recommended that they concentrate their efforts on a low number of projects where clear positive outcomes can be secured, and where Amigos can establish a solid reputation for serious, conscientious work. Such would be the argument to use in its confrontation with CIQRO, as opposed to the risk entailed in adopting a great number of small projects where no staff member is an expert. Those long shots can damage Amigos' credibility and eventually hurt the project.

As refers to the project's social component, securing additional expertise in the field is recommended, as well as establishing a more participatory strategy, where the local contribution would be higher and external funding less necessary.

IV.4 Institutional Aspects

IV.4.1 Institutional Structure for Managing the Reserve:

The Sian Kaan Biosphere Reserve was formally established in 1986 through a Presidential Decree, under the administrative responsibility of the Secretariat for Urban Development and Ecology (SEDUE). The reserve's internal organization is portrayed here:

SIAN KA'AN Biosphere Reserve
Board of Directors

Technical Coordination Unit	Director of the Reserve	Representatives' Council

Programs:

Public Use (1)	Resource Mgmt. (1)	Monitor -ing (1)	Patrol (10)	Maintain-ance (1)	Education (2)	Adminis-tration (1)

The Board of Directors has a President (delegate from SEDUE), a Vicepresident (delegate from the State of Quintana Roo government); and two members representing the two City Councils. Allowed to speak but not to vote are representatives from the Fishermens Cooperatives Federation, the National Archeology and History Institute (INAH), the Automous University of Mexico (UNAM), the Quintana Roo

Research Center (CIQRO) and Amigos de Sian Kaan.

The Council of Representatives was created in a supportive role toward the Reserve and the Reserve's director. There are six members from the public sector: SEDUE, State Government, two city Councils, CIQRO and INAH. The rest are members of a number a of interest groups: The Fishermen Cooperatives from Punta Allen and Puerto Herrero (settled within the Reserve) and Cozumel (who fish inside the reserve); groups of farmers and coconut producers, and individual land owners; and Amigos de Sian Kaan.

The main responsiblity of the Council of Representatives is to advise the Reserve's director, particularly on issues that pertain to the Reserve's operation. Although the council is willing to assume a decision making role, SEDUE is apparently reluctant to allow that to happen. For the time being the council remains a consultative body, more important in securing the interest groups cooperation than in providing outside views to the Reserve's management.

While the diagram shows a level of programs, it is, in fact, more an ideal or expected structure than a description of their real occurence. The scanty staff allocation of the Reserve, and their not always adequate preparation to assume activities that require specific training (such as natural resource management, education,etc.), has resulted in the programs becoming functions assigned to individuals with joint responsibility for patrolling, developing a given program, administering funds, coordinating operations, etc.

In summary, the Reserve's diagram is far from being appropriately implemented. Furthermore, at the time of our visit, the bulk of the Reserve's staff, including its director, had been fired en masse due to a change in central government, leaving the Reserve unmanned for several weeks. At the time of our departure the problem had not been solved yet. Events like these tend to bring great uncertainty and instability to the reserve, an unfortunate fact.

IV.4.2 Project Implementation:

The project funded by the Wildlands and Human Needs Program through Amigos de Sian Ka'an inserts itself into the Reserve's operation in support of two programs: the public use program -- where the research on fauna (crocodiles, butterflies and deer) for commercial exploitation projects lie -- , and the natural resource management program -- where the lobster, palms and intensive farming projects fit.

Project's Insertion into Reserve's Programs

SEDUE

RESERVE

Program

Collaborating Agencies:	Public Use	Resource Mgmt.	Others
Amigos de Sian Ka'an	fauna projects - crocodiles - butterflies - deer	research projects: - lobster - palms - intensive farming	
CIQRO		- lobster	

The diagram above shows that the research center for the region (CIQRO) is also working with lobsters -- which is a most important source of income for the local fishermen communities and the State of Quintana Roo). This takes us to a problem that has relevance for the projects ability to fulfill its objectives: the rivalry between Amigos de Sian Kaan and CIQRO. The latter is a public sector, state funded, scientific research institution; the first is a private sector, donations dependent, applied research and community education organization. The conflict would seem to have evolved (or perhaps originated) into a personal confrontation that is hurting Amigos de Sian Kaan in the Reserve's operations.

The presence of this conflict is all the more unfortunate because Amigos de Sian Ka'an could greatly use the participation of CIQRO's scientific advisors in the implementation of some of its projects. Those projects, although counting on the expertise of its own staff ("tecnicos" and the voluntary but sporadic help of out-of-state experts) would not seem to be able to stand close scrutiny.

IV.4.3 Analysis of Amigos de Sian Ka'an:

At the moment Amigos relies upon unstable sources of expertise, partly because of lack of funding, partly because of an institutional strategy of limited growth. However, if the benefits of such cautious strategy are to be positive, permanent scientific and technical capability within Amigo's de Sian Ka'an (if CIQRO's support is out of the question) should be secured, especially as Amigos' prestige is at play.

On the same subject of Amigos de Sian Ka'ans' internal

organization, a number of additional observations are relevant. Amigos was created as a lateral resource organization to support the reserve, channel external funds for it, facilitate problem solving, coordinate community work, foster public support for it, and ensure continuity in the reserves program implementation. Amigos has emphasized public education -- through slide shows, exhibits, conferences etc. Its fundraising capability is mostly devoted to keeping itself afloat. For operations Amigos depends on local donations and membership contributions; for staff salaries on the Nature Conservancy, and for project money on external funding sources such as the World Wildlife Fund.

Thus, Amigos de Sian Ka'an is organized as follows:

Board of Directors

Executive Secretary — Coordinating with

Staff

Education	Membership	Fund Raising	Projects	
(3)	(1)	(1)	- fauna - research	- UNAM
	Field Technitians			

Secretary/Accountant

For the implementation of activities directed to the general public and to the local communities, Amigos de Sian Ka'an mostly depends on biologists; no professionals from the sociology, anthropology or social communications fields have been enlisted. The level of training of the staff devoted to Amigos' own projects varies (PhD level scientist in the palms project, a local engineer in agronomy and his assistant, and the field team of biologists at the UNAM). These same people provide support for the fauna projects. There is great concentration of responsibility upon the executive secretary who centralizes decision making.

Amigos de Sian Ka'ans' fundraising capability is still incipient and needs to be strengthened through training. It is important to emphasize the value of the staff's commitment to their work.

In general, some overall technical supervision is needed to provide coherence and consistency to Amigos de Sian Ka'ans' work. The addition of professionals in the social sciences and environmental education fields is also a must.

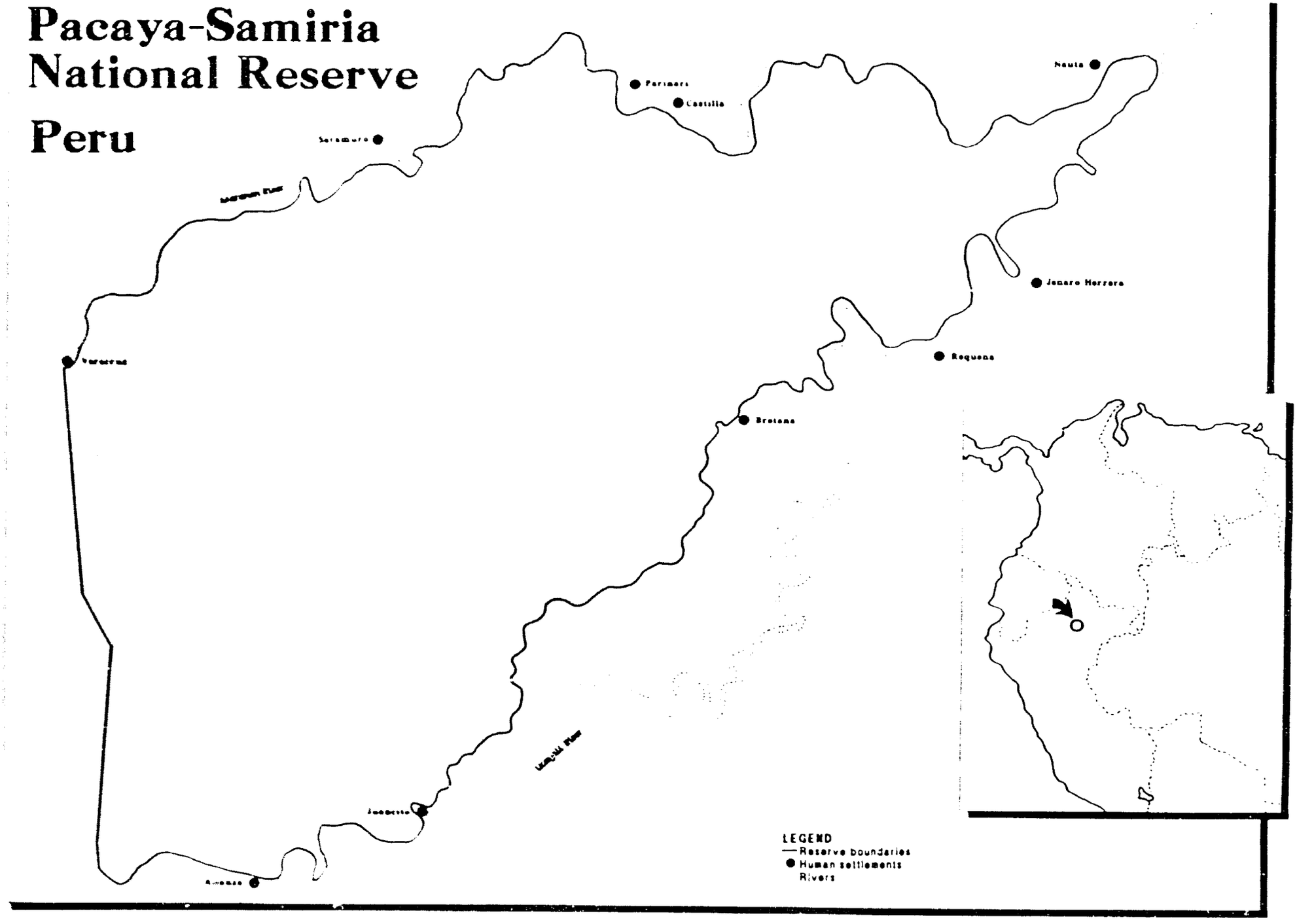
Finally, the organization support base seems restricted to the Cancun area. It is interesting to note that, although there seems to be contact between the project director and other conservation organizations in Mexico, those are not being used as spokespersons or lobbyists, despite the location of some of them in Mexico City, the center of all bureaucratic and political negotiations in the country. It would seem as if Amigos remain somewhat isolated from the NGO community although there seems to be openness toward future nexus with it.

Amigos de Sian Ka'ans' ability to coordinate effectively with the public sector is to some extent constrained by the presence of the above mentioned conflict with CIQRO; Amigos may need additional help and new strategies to cope with these problems, one that threatens its work at the moment.

It is recommended that the technical/scientific staff of Amigos de Sian Kaan be strengthened, the logistic and fundraising capabilities be improved, and its power base be enhanced.

Pacaya-Samiria National Reserve

Peru



V. PACAYA-SAMIRIA, PERU

V.1 Site Description

V.1.1 General:

Pacaya-Samiria lies between the Maranon and Ucayali Rivers beginning at their confluence, the point of origin of the Amazon River, and extending several hundred kilometers upstream on each river. This enormous triangle of land encompasses an area of more than 2,000,000 hectares. It contains two entire watersheds: that of the Pacaya River, tributary of The Ucayali, and that of the Samiria River, which enters the Maranon. The area is generally flat with little relief. At the point where the Maranon and Ucayali join, elevation above sea level is about 110 meters.

Precipitation, which averages about 3,000 millimeters per year, is heavier in the period December to May and lighter in the period June to November. This seasonal difference in precipitation is more pronounced upstream on the slopes of the Andes, giving rise to large fluctuations in water levels, especially of the Maranon and the Ucayali. At high water in May the rivers average seven meters higher than at low water in September. Extreme difference in water level approaches 12 meters.

V.1.2 Natural Resources:

Aquatic habitats: The principal aquatic habitats of Pacaya-Samiria are the rivers themselves which harbor a huge diversity of fish (over 200 different species) as well as other significant fauna: manatees, river dolphins, black cayman, white cayman, and two turtles, locally named charapa and taricaya, which are hunted for their eggs and meat. In addition to the rivers, numerous lakes, mostly abandoned sections of former river channels, abound. These provide habitat to the paiche, a highly prized food fish that attains weights well in excess of 100 kg.

Such a watery area includes numerous permanent and seasonal marsh habitats. During high water the rivers overflow their banks, providing enormous shallow expanses in which fish can forage for food that has accumlated during the dry season.

Most of the aquatic fauna sought by man are most vulnerable during low water when habitat area is reduced and they are more accessible. This is the season when turtles and cayman lay their eggs on sand bars and river beaches and the eggs, in turn, are dug up by hunters. The paiche, on the other hand, suffers more fishing pressure in the high water season when lakes can be reached more easily by channels that

connect to the rivers.

Terrestrial habitats: Virtually all the land in Pacaya-Samiria supports forest. Most of this is tall, highly diverse, evergreen forest. Some, however, is swamp forest, the nearly pure aggregations of aguaje palm forming a notable example. Some logging has occurred in this forest for the more valuable timber trees. Small amounts have been cleared for agriculture and there are areas of secondary forest in various stages of succession. In general, however, the forest presents a nearly unbroken cover over hundreds of square kilometers.

The forest provides habitat to a large variety of fauna, notably monkeys, cats and various game species such as deer, wild pigs, the several large tropical rodents and the edible tortoise or motelo. Hunting tends to occur mostly during high water when animals congregate on isolated parcels of high ground where they are vulnerable to approach by canoe.

Avifauna: Both aquatic and terrestrial habitats support a highly diverse avifauna, among which some species attain large populations. Notable rare birds include harpy eagles, jabiru storks, and various macaws. Herons and other waders, kingfishers, swallows and parakeets are notable for their numbers.

V.1.3 Protected area:

The Pacaya-Samiria National Reserve was established as a protected area in 1940 and has since been under continuous protection. At one time several villages existed within the Reserve, but about 15 years ago these populations were relocated outside the Reserve. Many people continue to harvest natural resources within the Reserve, both for personal use and for commerce. This harvesting is illegal but it continues to occur as a matter of tradition and because the authorities are not numerous enough or well enough equiped to halt it completely. On the other hand, the protection effort has succeeded well enough that resources within the Reserve are noticeably better conserved than outside.

Recently, the Reserve has been zoned for various levels of management, e.g. recuperation, research, recreation, and restricted resource utilization. Additionally, buffer areas have been designated along the Ucayali and Maranon adjacent to the Reserve. Peruvian law allows controlled harvesting within reserves but thus far no specific harvesting program has been set for Pacaya-Samira.

V.1.4 Infrastructure:

No roads exist anywhere in Pacaya-Samiria; all travel

and transport in the area is by water. A road now under construction between Iquitos, 90 km downstream on the Amazon, and Nauta, at the mouth of the Maranon, will soon bring vehicles to the edge of Pacaya-Samiria but not actually into it.

Several guard posts, two administrative bases and three research stations have been built inside the Reserve. These provide some official presence in the Reserve but not sufficient presence to completely control illegal entry and poaching.

V.1.5 State of Conservation of Resources:

The uneasy balance between protection and poaching at Pacaya-Samiria has seesawed back and forth for more than 45 years. Protection has been reasonably successful, though some species like the giant river otter have declined from abundance to near extinction.

In recent years some animals that had suffered heavy hunting and capture have made a comeback. Peruvian officials report that illegal hunting of cayman and cats for skins has nearly ceased. Likewise, they claim that capture of monkeys and macaws for live export has declined markedly.

On the other hand, harvest of turtles, turtle eggs, cayman eggs, paiche and wild game continues unabated. Good data on the population dynamics of these species do not exist; some of them may be in serious danger.

V.2 Project Description and Analysis

V.2.1 Master Plan:

In 1986 COREPASA, the committee of representatives of government agencies responsible for Pacaya-Samiria, prepared and published the Master Plan for the Pacaya-Samiria National Reserve. The master plan will guide management and development of the Reserve over the next few years. It proposes a strategy that relies on improved infrastructure, staff training and institutional development to accomplish the plan's projects.

V.2.2 Protection:

Protection continues as the central function for the Reserve, around which other project activities will revolve. The Master Plan calls for more guard posts; more boats, motors and radios for better communication; and more and better trained guards. That will take money. The principal obstacle to greater vigilance over the Reserve has always been insufficient funds to hire enough guards and support people, with good equipment and adequate budget for

operations. Operations are expensive at Pacaya-Samiria. Gasoline costs nearly two dollars a gallon retail at Nauta and it takes a lot of gasoline to cover the vast distances of the Reserve in the fast motor boats needed to keep on top of poaching.

The basic object of the protection project is simply to have enough guards spread well enough around the Reserve to deter poaching better than it has been deterred in the past. These guards need more training to understand their jobs better and perform them more professionally. The Master Plan envisions on the job training for all personnel involved in protection plus courses and seminars for key supervisory people. Some training has occurred already and more is scheduled for the remainder of 1987 and for 1988. As an example, the area director for the Samiria area of the Reserve has been nominated to attend an international seminar in park management which will soon occur shortly in Mexico and Central America. He follows the reserve director who recently returned from a similar seminar.

V.2.3 Research and Natural Resources Management:

Research and Natural Resources Management have long been associated with the basic protection function of the Reserve. These activities tend to apply to commercially valuable faunal resources. Two current project components at the Pithecia research station on the Samiria River illustrate this point. One project component consists of collecting turtle eggs shortly after they have been deposited and transfering them to protected artificial nesting sites at the station. Here the eggs are guarded over the approximately 100 day period until they hatch. After hatching, the young turtles are dispersed along the length of the river.

This artificial hatching has gone on for several years at the Reserve and has reached a high level of success. Hatching rate for taricaya exceeds 90 percent and approaches 80 percent for charapa. Reserve personnel continiue to expand the project, collecting more eggs and experimenting with techniques to increase hatching to even higher levels. This year nearly 7,000 taricaya eggs and a lesser number of charapa eggs have been collected and placed in artificial nests.

The other illustrative project component at Pithecia, more recently established than the work with turtle hatching, deals with research on wild monkeys. Reserve personnel are undertaking systematic observation of troops of several species of monkeys. The observations serve two purposes: one is to learn more about the monkeys' behavior and breeding habits; the other is to determine the degree to which the monkey populations can be harvested to provide subjects for export for medical research. This work ties directly to

ongoing breeding and research under laboratory conditions at Iquitos conducted by IIAP, the Research Institue of the Peruvian Amazon.

V.2.4 Environmental Education:

Environmental education, especially formal environmental education, constitutes a relatively recent activity at Pacaya-Samiria. Novel though it is, it has attained striking success. Just this July, COREPASA, with funding from the World Wildlife Fund, and international and Peruvian faculty, put on an educational event it called the "Mobile Seminar". The mobile seminar had two audiences. One group of 28 participants composed of Reserve personnel and teachers, health workers and law enforcement officials from local communities spent two weeks traveling in the Reserve learning about its resources and their management. They also visited eleven river communities around the edges of the Reserve. These communities provided the other audience for the seminar: people whose lives are affected by the Reserve, often directly as its resources provide them with subsistence and income. This audience also learned about the Reserve and interacted with the participant audience and the faculty to express its viewpoint about the Reserve and appropriate use of its resources.

COREPASA plans to hold more mobile seminars. It also plans additional training for Reserve staff and other kinds of community information events.

V.2.5 Rural Ecodevelopment:

At this point rural ecodevelopment isn't really a project, only a project concept that COREPASA would like to begin putting into effect. Rural ecodevelopment would consist of improved agriculture and animal husbandry activities in communities near the Reserve. Reserve officials believe that, if people living in the communities spend more time on and derive more income from agriculture and animal husbandry, they will have less need and less desire to harvest resources from the Reserve.

Next year COREPASA hopes to expand its staff and have a large enough budget to start actual work on rural ecodevelopment.

V.3 Social Aspects

V.3.1 History and Distribution of Population:

The Pacaya-Samiria National Reserve (PSNR) presents a very peculiar case in terms of human occupation of the area. Established in 1940, the Reserve has gone through a number of socially significant processes, of which perhaps

the most relevant was the resettlement of practically all those dwelling inside the Reserve in the eraly 1970s. Hundreds of families were removed from the Samiria and the Pacaya rivers. Those groups settled along the Reserve's boundaries, mostly at the junction of those rivers with the Maranon and the Ucayali.

Only some one hundred people remain at the headwaters of the Samiria; such is the actual population within the Reserve. In the area's surroundings, a population of some 50,000 people is estimated, including the resettled people but excluding large urban communities like Nauta, Leoncio Prado, Lagunillas, and Bretania. Several generations of river dwellers occupy small towns like San Martin, Santa Rita, and other towns along the banks of the Maranon, Canal de Puinahua, and Ucayali.

The rural settlements tend to resemble each other in their ethnic composition --so called mestizo, with a strong indigenous background, but Spanish speaking and having adopted westernized clothing-- , and their community structure --most dwellers in each town are related to each other forming great family complexes where political (appointed) and civilian (elected) authorities belong to the clan.

All these communities keep some close relation to the Reserve; all have been and are affected by its establishment, and some have greater impact than others upon the administration of its resources.

V.3.2 Production Systems:

There are two principal production systems taking place in the area. The first affects the Reserve directly, while the second is perceived by the area's administration as a preferred alternative.

The first of these two systems is the illegal collection of fauna (particularly paiche, turtle and crocodile eggs) within the Reserve for sale to intermediaries. The latter play a critical role as they bring in the pressure from the extra-regional demand for those products, and promote such illegal activities. The intermediary (called locally "habilitador", or enabling agent) not only buys the product but often makes advance payments in cash, tools or basic staples not available in the area, that force the seller into a temporary or permanent indebtedness situation. The problem is worsened because often local political and civilian authorities adopt the "habilitador" role, making site control impossible. As the Reserve places obstacles to the intermediaries' activities, those instigate rebellion and opposition to the Reserve. Finally, the illegal collection activity tends to be concentrated, although not exclusively,

in the newer towns, those housing the people resettled from the rivers. In spite of the 15 year span that separates that event from today, it is possible that some resentment remains among those resettled, making their collaboration with the Reserve pursuits less likely than otherwise.

By thus providing the capital investment into an activity that is the sole income generating source for a number of communities, the "habilitador" personalizes what may be the greatest social conflict between the Reserve and its neighboring populations. Most threatened are a handful of greatly demanded items, but a number of other species are also affected by those same communities' illegal hunting and fishing for consumption or small scale trade.

V.3.3 Strategy for Improved Resource Use:

Toward this problem the Reserve and its collaborating institutions have found only partial solutions. So far, seizing the catch and fining the perpetrator has been the policy. This policy has had limited success because of the great size of the Reserve, its complex network of alternative riverways, and the reduced number of park rangers in charge of illegal activity control with no adequate communication systems and restricted funds for patrolling.

In the future, plans seem to be to foster alternative income generating activities --diversify the fish catch, promote agriculture, handicrafts, etc. No clear plan is actually in place. Only recently has a socio-economic profile been finished; based on its findings an appropriate strategy is expected to be reached.

Although too early to comment on that strategy, some hints of the Reserve's attitude toward the problem have been observed. It seems as if more attention is being given to activities other than current resource exploitation for the purpose of future management. There is little talk about rational exploitation of the paiche, or community managed turtle or crocodile farms. The project seems to overlook the power of the external demand for those products, demand that will continue to push for illegal extraction even if the new productive activities are adopted. Additional attention is needed toward more rational exploitation of currently demanded products; a first step must be both biological studies --population dynamics, reproduction cycle, etc-- and market studies.

V.3.4 Community Involvement in Reserve Management:

A second observation has to do with the level of community participation observed around project activities. Those communities are apparently seen either as a source of problems or as a potential subject of education on the rationale for adopting a conservationist attitude. At present, all experimental work at the research station in Pithecia is conducted by professionals, technicians or students working for the Reserve.

This observation, coupled with the selection of resources as alternative income generators that avoid current major products of the Reserve, may provide enough grounds to say that the project does not really seem to conceptualize the communities as potential resource managers, and that it seeks only limited involvement from them at present. Nevertheless, if the aim is to conciliate development and conservation needs, and to make of the communities not only rational resource managers but active elements in its protection, additional work with the communities is recommended.

V.3.5 Increasing Agricultural Production:

Going back to the two productive systems in place in the area, the second of those is agricultural production. The majority of settlements along the Maranon, Ucayali and Huallaga, as well as the older communities at the junction of the Pacaya and Samiria with the Ucayali and the Maranon, practice agriculture for consumption and for regional markets. Agriculture is favored by the Reserve's administration because it is thought to divert pressure upon its faunal resources.

The Reserve's current administration supports the intensification of agriculture by those originally settled into or around the Reserve, looking for means to enhance their income generating capacity. The principal obstacle faced here is the unclear legal land tenure situation of the settlers. Although the Reserve's Decree speaks of guaranteeing land use rights for the area's traditional occupants, it does not explicitly allow for legal titling of those lands. Legal titles are in turn a requisite for allocation of credit to the farmer according to the Agrarian Bank's regulations. Thus, no title no credit, and no credit no enhancement of agricultural activity.

The project's implementing institution, COREPASA, plans to coordinate land surveying and mapping by the corresponding public sector agencies in an effort to give legitimacy to the farmers' pledge; the institution could also back up registered farmers' requests for credit to the Bank.

Alternative paths of action are still being analyzed. It is only certain that, in order to foster the development of agriculture and other resource utilization activities, legal obstacles which derive from the Reserve's legislation must be overcome to achieve the desired ends.

If COREPASA is to be effective in strengthening agricultural productivity in the area --and this is referred to when analyzing this project's institutional aspects--, it would have to engage in actions designed to facilitate marketing, as those are a necessary complement to improved productivity.

However, a very active agricultural community may present problems to the Reserve that are not yet fully anticipated. In other words, this strategy would need some further analysis to avoid undesired lateral effects from what seems today a sound course of action.

COREPASA is only initiating its work at all fronts. It wouldn't be fair to expect from it a well developed social and economic strategy, especially given the complexity of the area and its population. In time, however, the project should assume careful planning in these fields. Additional guidance and additional staff trained in community work and economics is recommended.

V.4 Institutional Aspects

V.4.1 Institutional Structure:

The Pacaya-Samiria National Reserve (PSNR) was originally established in 1940 and has undergone varied administrative arrangements. Until 1985, the Reserve was managed by the Ministry of Fisheries, which reportedly devoted itself mostly to the extraction of paiche and other products from the reserve.

In 1985, responding to a central government perception of the need to diversify and balance the different objectives assigned to the Reserve, and to provide it with a coherent administration, COREPASA was created. COREPASA (Comite local de Desarrollo de la Reserva Nacional Pacaya-Samiria) is a multi-institutional commission made up of thirteen institutions representing the fields of agriculture, fisheries, scientific research, education, health, energy and mining, industries, housing and construction, police and regional development.

Representatives from all these institutions function together as a commission, supervising the decisions enacted by the Board of Directors. The diagram shows these lines of authority:

COREPASA

Board of Directors

Director

Public Relations/
Operations

Sub-Director for
the Pacaya area

Sub-Director of the
the Samiria area

V.4.2 Funding:

COREPASA does not have a budgetary allocation of its own; it depends upon funds provided by the Loreto Regional Development Corporation (CORDELOR), which, in turn, derives its funding from a certain percent of the income generated by oil exports -- like most other local institutions in Loreto.

All funds allocated by CORDELOR to COREPASA are channelled through the Ministry of Agriculture's regional office; these funds cover the salaries of the Director and Sub-Directors. Personnel hired by institutions who are members of COREPASA play supporting roles for COREPASA. The Ministry of Agriculture has allowed three professionals (two biologists and one agronomist) to assume responsibility for a number of programs at COREPASA (resource managment, research, ecodeveloment and environmental education). Less direct responsibilities, though no less important functions, have been assumed by other professionals hired by other institutions supporting COREPASA's work, among them are an anthropologist, biologists, etc. The Ministries of Agriculture and Fisheries provide the park rangers, five and twenty of them respectively, a number that is deemed insufficient to cope with the reserve's needs, particularly given the lack of adequate communication facilities in the field.

Other institutions like the Peruvian Amazon Research Institute (IIAP) contribute by assuming the expense of promotion and educational activities or materials for the use of COREPASA.

External funding (WWF's) covers specific activities (education and management plans), infrastructure (guard posts, boats) and operating costs. So far local funding has provided a stable counterpart to international support. Prospects for 1988 seem to be much less promising. CORDELOR has announced the restriction of its funding to COREPASA reflecting, in turn, the future reduction of its own income from oil exports. Although CORDELOR's executives have assured that some compensation would be found, the Ministry of Agriculture's regional officer has reportedly informed

COREPASA, of the cessation of CORDELOR's funds for the Committee.

Financial uncertainty is a major constraint to continued and stable growth for COREPASA. Its situation is particularly critical because of its dependence on other institutions for the entirety of its budget. Not being an institution with an operations budget allowance, COREPASA is vulnerable to circumstancial changes in funding for the Loreto Department.

In 1988 a country-wide "regionalization" effort will be undertaken; as a result city and town councils would gain access to unprecedented funds from a variety of sources, in particular from oil exports under a percentage arrangement, an arrangement that is, in fact, the origin of the future reduction in income for the regional development corporation. Those councils would become a potential source of funding for COREPASA, if appropriate proposals are presented to them.

V.4.3 Strengthening COREPASA:

The financial constraints and opportunities referred to here not only affect the institutional situation of COREPASA, but they reflect it. Under current circumstances, COREPASA does not really have a cohesive and strong institutional structure. Particularly, its inability to support permanent staff, and to get sustained financial allocations from the central or regional governments, are the two most important factors in this respect.

In terms of staff, the absence of professionals trained in social and economic sciences is especially detrimental to the Reserve's ability to cope with its professed intention of conciliating developmental and conservation interests. The small staff currently in place depends greatly upon the support of those professionals "borrowed" from other institutions, a situation that does not tend to permanence but to instability. At the very least, those borrowed professionals cannot commit their full time help to COREPASA.

Strenghthening COREPASA's permanent staff capability is strongly recommended. Given the nature of its present arrangement (where its staff allowance results from the contribution of the participating agencies), adequate additions of professionals in the social and economic sciences cannot be expected. New staff members, hired directly by COREPASA would be necessary. Similarly, new capability in the fields of project design (essential to reach new funding sources or to expand the base of support from the current funders like CORDELOR for example), market analysis and community development work, is also much needed.

In the future, strengthening COREPASA's staff and financial stability would be not only desirable but necessary because of COREPASA's peculiar role toward the area where the Reserve is located. In the area, local and regional development agencies have limited presence. COREPASA is already seen as an alternative source of help. In fact, expectations have been and will continue to be raised as COREPASA's work becomes better known and extended. It is possible and probable that COREPASA would assume, at some point, functions that normally pertain to development agencies, particularly given the clear complementarity that exists between its conservation objectives and the surrounding communities' development (for example, the strengthening of agriculture in the region). This tendency to expand COREPASA's role is already evident as it is now engaging in facilitating credit opportunities for local farmers and in solving legal obstacles to that purpose.

CORPASA may not be able to cope with its greater commitments solely through its coordinating function (which is in essence what is in place at the moment), unless it enhances its technical and operational base.

For the time being, however, COREPASA exhibits a remarkable achievement in terms of interinstitutional coordination; this is perhaps its greatest asset. A strong internal structure would enhance the reach of this coordination and would add to COREPASA's ability to negotiate with the member institutions of the Committee.

5. ANNEXES

5.1 List of People Interviewed During the Evaluation

(a) At the World Wildlife Fund, Washington:

Michael Wright
Dennis Glick
Jack Noble
Catherine Fuller
Curtis Freese
Natalie Waugh
Diane Wood
Liz Boo
Gus Medina

(b) Other Persons in Washington:
Douglas Pool
Mac Chapin

(c) At USAID offices abroad:

Frank Zadroga
Raymond Waldron
Howard Clark

(d) In Costa Rica for the Gandoca Project:

Jim Lynch, Director, ANAI
Benson Robinson, ANAI
Alberto Salas, ANAI and CIDESA
Jorge Avendano,Director, Cadaster Office
Alejo Quezad, National Geographic Institute
Guillermo Canessa, Sub-Director General, Ministry of Natural Resources, Wildlife Service

(e) In St. Lucia for the South East Coastal Resource Management Project:

Yves Renard, Project Director, ECNAMP
Allan Smith, Scientific Advisor to the project, ECNAMP and National Research and Development Foundation
Leslie Charles, Forestry Specialist, ECNAMP
Robert Devaux, Director, St. Lucia National Trust
Felix Finisterre, Senior Officer, National Research and Development Foundation

(f) In Mexico for the Sierra de Manantlan Project:

Laboratorio Natural las Joyas:

Rafael Guzman, Director of the project
Eduardo Santana, Project staff
Maria De Jesus Anaya, Project staff

Raquel Gutierrez, Project staff
Pedro Cruz, Project staff
Antonio Vasques, Project staff
Carmen Anaya, Project staff
Jorge Tellez, Project staff
Esperanza Lopez, Project staff
Arturo Solis, Project staff
Rosario Rinead, Project staff
Borger Jensen, Project staff

BIOJACO:

Julio Delgado, Executive Director

(g) In Mexico for the Sian Ka'an Project:

Amigos de Sian Ka'an:

Arturo Lopez, Project Director
Enrique Dude, Project staff
Marcela Alvarado, Project staff
Ingrid Olmstead, Project staff

(h) In Peru for the Pacaya-Samiria Project:

Robert Rojas, Director of Forestry and Fauna Division, Ministry of Agriculture, President of COREPASA
Luis Moya, COREPASA
Walter Herrera, Project Director, COREPASA
Filomeno de Encarnacion, IVITA
Rolando Corrales, Ministry of Educaiton
Augusto Fachin, UNAP
Edward Diaz, Regional Office, Ministry of Agricuutre
Benjamin Lozano, Ministry of Fisheries
Wilfredo Mesa, IIAP
Gustavo Lopez, CORDELOR
Loor Geoverdi, UNAP
Gustavo Arteta, Forestry Police
Jorge Quintana, Ministry of Health

5.2 List of Institutions Referred to in the Text of the Evaluation:

ACRONYM	Actual Name	Translation
	(COSTA RICA)	
ANAI	Asociacion de los Nuevos Alquimistas	New Alchemy Institute
CIDESA	Corporacion de Investigaciones para el Desarrollo Socio-Ambiental	Corporation for Research on Socio-Environmental Development
	Oficina de Catastro Ministerio de Justicia de Costa Rica	Cadaster Office, Ministry of Justice of Costa Rica
IGN	Instituto Geografico Nacional	National Geographic Institute
SNVS/MAG	Servicio Nacional de Vida Silvestra del Ministerio de Recursos Naturales de Costa Rica	Wildlife Service, Ministry of Natural Resources of Costa Rica
IDA	Instituto de Desarrollo Agricola	Institute for Agricultural Development
	(SAINT LUCIA)	
ECNAMP		Eastern Caribbean Natural Areas Management Program
		St. Lucia National Trust
		National Research and Development Foundation
		National Development Corporation
	(MEXICO-MANANTLAN)	
LNLJ	Laboratorio Natural de "Las Joyas"	Las Joyas Natural Laboratory
UG	Universidad de Guadalajara	Guadalajara University

ACRONYM	Actual Name	Translation
BIOJACO	Bio Jalisco-Colima	
	(SIAN KA'AN, MEXICO)	
ASK	Amigos de Sian Ka'an	Friends of Sian Ka'an
INIREB	Instituto de Investigaciones de Recursos Bioticos	Biological Resources Research Institute
CIQRO	Centro de Investigaciones de Quintana Roo	Quintana Roo State Research Center
SEDUE	Secretaria de Desarrollo Urbano y Ecologia	Secretariat for Urban Development and Ecology
UNAM	Universidad Autonoma de Mexico	Autonomous University of Mexico
CONACYT	Consejo Nacional de Ciencia y Tecnologia	National Science and Technology Council
EARTHWATCH		
	Cooperativa de Pescadores de Punta Allen	Punta Allen Fishermen's Cooperative
INAH	Instituto Nacional de Arqueologia e Historia	National Archaeology and History Institute
	(PACAYA-SAMIRIA, PERU)	
COREPASA	Comite Local de Desarrollo de la Reserva Nacional Pacaya-Samira	Local Committee for Development of the Pacaya-Samiria National Reserve
IVITA	Instituto de Investigaciones Tropicales y de Altura, de la Universidad de San Marcos	University of San Marcos, Tropical and Highlands Research Institute
UNAP	Universidad Nacional de la Amazonia Peruana	Peruvian Amazon National University
CORDELOR	Corporacion de Desarrollo de Loreto	Department of Loreto Development Corporation

ACRONYM	Actual Name	Translation
IIAP	Instituto de Investigaciones de la Amazonia Peruana	Peruvian Anazon Research Institute
PSNR	Reserva Nacional Pacaya-Samiria	Pacaya-Samiria National Reserve
	Ministerio de Pesqueria, Oficina Regional	Ministry of Fisheries, Regional Office
	Ministerio de Agricultura, Oficina Regional	Ministry of Agriculture, Regional Office

5.3 List of Selected References

(a) Program:

World Wildlife Fund. March 9, 1987. Program Report on the Matching Grant for a Program on Wildlands and Human Needs Awarded by the United States Agency for International Development.

(b) Gandoca, Costa Rica:

ANAI, Inc. 1986. Annual Report-1986. 1176 Bryson Road, Franklin, N.C.

Project Agroforestal Area. 1986. Distancias de Siembra. Serie de Boletines Tecnicos para el Agricultor. Boletines tecnico N. 2. Asociacion de los Nuevo Alquimistas.

Salas, Alberto and Herman Venegas. 1987. Projecto de Ecodesarollo de Talamanca Provincia de Limon, Costa Rica. Asociacion ANAI.

(c) Southeast Coast, Saint Lucia

Smith, Allan. 1986. Guide to Seamoss Culivation in the West Indies. Caribbean Conservation Association, Barbados.

(d) Manantlan, Mexico:

Guzman Mejia, Rafael and Esperanza Lopez Zarrela. 1987. Reserva de la Biospera Sierra de Manantlan Plan Operativo 1987. Universidad de Guadalajara, Laboratorio Natural las Joyas de la Sierra de Manantlan. Guadalajara, Jalisco, Mexico.

Universidad de Guadalajara, Laboratorio Natural las Joyas. undated. Reserva de la Biosfera Sierra de Manatlan, Atlas Cartografico.

(e) Sian Ka'an, Mexico

Centro de Investigaciones de Quintana Roo, a.c. 1983. Sian Ka'an Estudios Preliminares de una Zona en Quintana Roo Propuesta como Reserva de la Biosfera. Puerto Morelos, Quintana Roo, Mexico.

(f) Pacaya-Samiria, Peru

COREPASA, Comite Local de Desarrollo de la Reserva Nacional Pacaya-Samiria. 1986. Plan Maestro de la Reserva Nacional Pacaya-Samiria. Loreto, Peru.

COREPASA, Comite Local de Desarrollo de la Reserva Nacional Pacaya-Samiria. 1987. WWF-US, Informe de Evaluacion 1987. Iquitos, Loreto, Peru.