

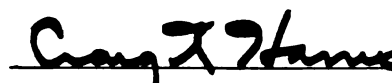
24678453



This is to certify that the
thesis entitled
Environment, Development and Indigenous Knowledge Systems:
A Participatory Action Research Approach Toward Natural
Resource Management in Costa Rica's Cocles/Kékóldi
Indian Reserve
presented by

Paula Ruth Palmer

has been accepted towards fulfillment
of the requirements for
Master's degree in Sociology


Major professor

Date 16 June 1989

PLACE IN RETURN BOX to remove this checkout from your record.
TO AVOID FINES return on or before date due.

DATE DUE	DATE DUE	DATE DUE
08 JUN	(GUN)	9 JAN 1990 2005
MAY 22 1992	SEP 23 1999	
	MAR 23 2000	
147	244	
FEB 07 1994	FEB 12 2002	
239	050202	
FEB 07 1994	FEB 20 2005	
SEP 12 2000	082404	
FEB 08 1995		
SEP 23 1999		

MSU Is An Affirmative Action/Equal Opportunity Institution

**ENVIRONMENT, DEVELOPMENT
AND INDIGENOUS KNOWLEDGE SYSTEMS:
A PARTICIPATORY ACTION RESEARCH APPROACH TOWARD
NATURAL RESOURCE MANAGEMENT IN COSTA RICA'S
COCLES/KÉKÖLDI INDIAN RESERVE**

By

Paula Ruth Palmer

A THESIS

**Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of**

MASTER OF ARTS

Department of Sociology

1989

1661991

ABSTRACT

ENVIRONMENT, DEVELOPMENT
AND INDIGENOUS KNOWLEDGE SYSTEMS:
A PARTICIPATORY ACTION RESEARCH APPROACH TOWARD
NATURAL RESOURCE MANAGEMENT IN COSTA RICA'S
COCLES/KÉKÖLDI INDIAN RESERVE

By

Paula Ruth Palmer

This study employs epistemological and political economic analyses to examine the social causes of environmental degradation in Costa Rica's Atlantic lowlands. Analysis of the Bribri Indians' conceptualization of the humankind-nature relationship supports theoretical assertions about the complementarity of indigenous knowledge systems and Western ecological science. This complementarity can be operationalized through Participatory Action Research (PAR), to increase the effectiveness of resource management by indigenous peoples. PAR equalizes indigenous and Western persons and epistemologies, and promotes self-determination and increased self-reliance. Through PAR, the Bribri Indians of the Cocles/Kéköldi Reserve planned and implemented strategies to protect their natural resources. They are using the ethnographic and ethnoscientific knowledge generated by PAR to reinforce and articulate their cultural traditions and environmental conservation policies. Through PAR, the Bribris acquired skills, self-confidence, and increased political effectiveness in protecting their natural resources.

ACKNOWLEDGEMENTS

The members of the governing board of the Cocles/KéköLdi Indian Reserve kindly gave me their permission to use data we collected together during the Participatory Action Research project which is described in this thesis. To all the people of the Cocles/KéköLdi Reserve, I am grateful for the friendships that emerged from our collective work and for the opportunities, past and future, to learn with them.

To the ANAI staff, and especially to Dr. William McLarney and James Lynch, I am grateful for financial and logistical support during the period of the research project and for ongoing opportunities to collaborate in sustainable development efforts in the Talamanca region.

As my academic adviser and major professor at Michigan State University, Dr. Craig Harris has been very helpful in stimulating and guiding my thinking about the theoretical issues raised in this thesis. Committee members Dr. William Ewens and Dr. Peter Gladhart also gave supportive comments. I am especially indebted to Dr. María Eugenia Bozzoli, professor of anthropology at the University of Costa Rica, for the intellectual legacy of her studies of Bribri

ethnography and for her continuing personal and professional encouragement.

Partial funding for the research project reported in this thesis came from Cultural Survival, Inc., and from the Office of the Vice-Chancellor for Social Action of the University of Costa Rica. A Foreign Language and International Development Studies Fellowship from MSU's Center for Advanced Studies in International Development supported my on-campus research.

TABLE OF CONTENTS

I.	Introduction: Background and Context for the Study	1
II.	Literature Review: Theoretical Perspectives on Environment, Development and Indigenous Knowledge Systems	7
III.	The Participatory Action Research Methodology . . .	23
	A. The Model	23
	B. The Cocles Indian Reserve Participatory Research Project	30
	1. Preliminary Steps	31
	2. Project Planning	36
	3. Data Collection	37
	4. Data Analysis	42
	5. Data Application/Utilization	45
IV.	Data and Discussion	54
	A. The Bribri Cognized Model of the Humankind-Nature Relationship	54
	1. The Essence and Origin of All Things	54
	2. Perceived Differences between Indians and Non-Indians	58
	3. Reciprocity	61
	B. Discussion	68
V.	Conclusions and Implications of the Study	78
	Bibliography	93

I. INTRODUCTION: BACKGROUND AND CONTEXT FOR THE STUDY

This study is based on a Participatory Action Research project conducted in the Atlantic lowlands of Costa Rica, under the auspices of ANAI, a regional non-profit, non-governmental organization for agricultural research, sustainable development and education. With a grant from Cultural Survival, Inc., ANAI hired me as Principal Investigator to study the management of natural resources within the Cocles Indian Reserve in Talamanca canton. A brief description of the circumstances and events which motivated this study follows.

In 1986, ANAI successfully persuaded the Costa Rican government to establish a 9,449-hectare terrestrial and marine Wildlife Refuge in the coastal region of Talamanca canton. The Wildlife Refuge gives protected status to one of Costa Rica's few remaining areas of lowland tropical moist forest, as well as to estuaries and coral reefs which are valuable breeding grounds for Caribbean marine species.

The establishment of such protected zones has been the Costa Rican government's principal action to prevent total destruction of the nation's forests, which are being cleared at the rate of 60,000 hectares annually (Hartshorne et al. 1982, p.28). Forested land dropped from 72 percent of Costa Rican territory in 1950 to 31 percent in 1977, almost all of it converted to pasture (ibid., p.68). Much of this land

was so unsuited for grazing that it has been able to sustain pasture for only about five years, due to rapid soil degradation (Jones 1989, p.10). Studies now show 41 percent of Costa Rican land moderately to severely eroded (Hartshorne et al. 1982, p.6). In the Atlantic lowland region, riverside deforestation by multinational banana companies and peasants has been shown to be responsible for the death of marine coral, as silt carried downstream settles on the coastal reefs and blocks the sunlight necessary for photosynthesis. The many alarming consequences of the destruction of the world's tropical forests, documented by Eckholm (1976) among many others, are all in evidence in Costa Rica's Talamanca canton. ANAI believed the demarcation of a Wildlife Refuge, which Costa Rican laws facilitated, was an important though certainly not sufficient step toward protecting the region's natural resource base.

Although ANAI's environmentalists have been seeking, through a variety of projects, to promote sustainable livelihood strategies for the peasant farmers and artisanal fishermen who live within the Wildlife Refuge and in the surrounding area, many local people reacted to the creation of the Refuge with suspicion, fear and resistance. The predominantly Black (Afro-Caribbean) coastal residents, for whom land tenure has been historically precarious, saw the Refuge as one more in a series of recent government moves to

displace them from the region and/or restrict their freedom to secure their livelihoods (Palmer 1986, pp.309-25).

Hispanic squatters and agricultural workers, whose massive migration to the Talamanca "frontier" region has doubled the canton's population in the last decade (Dirección General de Estadística y Censos 1974, p.6 and 1984, p.6), had already been dislodged from agricultural lands in the country's Pacific region by rapidly expanding agro-export and ranching conglomerates (Augelli 1984, pp.49-54). For these land-hungry "refugees", restricting agricultural expansion into "useless" forest was more than a threat to the only means of livelihood they know; it was also an affront to their calling, as Christians, to dominate the earth, and as patriotic Costa Ricans, to increase agricultural production and colonize the hinterlands (Bozzoli 1986, pp.12-13).

Logging companies, land speculators and tourism developers, who had only recently gained access to the Talamanca coastal lowlands with the coming of roads and electricity in the 1980's, were able to capitalize on the legitimate fears of resident Blacks and on the necessities and ambitions of incoming Hispanic settlers, to challenge the Wildlife Refuge.

ANAI and its allies within the Talamanca communities as well as in international funding agencies, Costa Rican universities and the Ministry of Natural Resources, sought, with some success, to out-manuever the external challengers

to the Refuge and to overcome opposition within the local communities through public meetings and the inauguration of land-titling, agricultural diversification and agro-forestry projects. But there was one group of people in the region whose attitudes about the Wildlife Refuge and about natural resource management in general were unknown. These were the Bribri and Cabécar Indians of the Cocles Indian Reserve, whose boundaries partly border the Wildlife Refuge.

The Cocles Reserve is one of 21 Indian reservations established in Costa Rica during the 1970's to forestall further Hispanic encroachment on lands held by the country's remaining indigenous population, estimated at 20,000 in total. The 3,500-hectare area encompassed by the Cocles Reserve is important ecologically. Its forested hills slope down to the Caribbean Sea on the north and east and to the Sixaola River Valley on the south, providing the watershed for the coastal and the valley populations. Both of these populations are rapidly expanding as tourism development comes to the coast and as in-migration of land-hungry peasants continues. More than half the Cocles Reserve remains in primary tropical moist forest.

While tribal people are generally found to employ sustainable land use practices (Clay 1988, p.72), the ANAI staff had little reason to assume "conservationist" principles among the people of the Cocles Reserve. Numbering fewer than 200, and these divided between two

language groups (Bribri and Cabécar),¹ the people of Cocles were "refugees" from the vast mountainous Talamanca interior, where some 4,000 Bribris and Cabécares live in much greater geographic and ethnic isolation. The Indians who began occupying the Cocles area in the 1920's came seeking work as peones for Black cacao farmers; they eventually established their own farms in the foothills. For some 60 years they had sold cacao, chickens and pigs and bought farm tools and dry goods in the coastal villages, attended churches and schools there and frequented the bars. They appeared to be completely acculturated. Still, the ANAI staff wondered if the Cocles people might become conservationist allies so that the Indian Reserve might effectively serve as an unofficial extension of the Wildlife Refuge under Indian management.

It was to explore this possibility that ANAI hired me to approach the Cocles people with a proposal to conduct an oral history study to learn about the Indians' attitudes toward natural resources and their present resource management policies, practices and problems. My qualifications as principal investigator were 14 years of experience living on the Talamanca coast, where I had

¹The Bribri and Cabécar languages are quite similar. The Cabécares, being the smaller of the two groups, generally speak Bribri, retaining a Cabécar accent. The people of the Cocles Reserve do not distinguish between Bribri and Cabécar cosmologies.

published two books of the oral history of the Afro-Caribbean population and directed, for four years, a community self-research project based at the regional high school.

Before I describe the research undertaken in the Cocles Indian Reserve, it will be helpful to discuss the theoretical issues that frame this inquiry into relations among environment, development and indigenous knowledge systems. A review of this theoretical literature, in Chapter II, leads directly into considerations of methodologies appropriate for incorporating indigenous knowledge and indigenous people into strategies for sustainable development. In Chapter III, the Participatory Action Research model is outlined as such an appropriate approach; the evolution of the Cocles Reserve research project into Participatory Action Research is also described. In Chapter IV, data gathered during the course of the research project concerning the Cocles people's view of the relation of human society to the natural environment, is summarized and discussed in light of the theoretical issues raised in Chapter II. A final chapter gives conclusions and implications of the study.

II. LITERATURE REVIEW: THEORETICAL PERSPECTIVES ON ENVIRONMENT, DEVELOPMENT AND INDIGENOUS KNOWLEDGE SYSTEMS

Development has been described as a "coevolutionary process between a social system and an ecosystem" (Norgaard 1981, p.238). Social structures (e.g., the global economic system, local modes of production and extraction) and social constructs (e.g., ideologies, world views) determine the impacts societies make on the natural environment; finite resource limits and the dynamics of physical ecology, in turn, set limits on and influence outcomes of societal endeavors. As Redclift (1987, p.199) argues, to achieve "sustainable development" requires an understanding that the limits of sustainability have both structural and natural origins.

Among social scientists engaged in development research or practice, recognition of this coevolutionary or dialectical process is not common. Catton and Dunlap argue that social science's uniform blindness to environmental factors warrants lumping all recognized theoretical frameworks together in a Human Exceptionalist Paradigm, to which they contrast a New Environmentalist Paradigm which asserts that:

- 1) Human beings are but one species among many that are interdependently involved in the

biotic communities that shape our social life;

2) Intricate linkages of cause and effect and feedback in the web of nature produce many unintended consequences from purposive human action;

3) The world is finite: there are physical and biological limits constraining economic growth, social progress and other societal phenomena (Catton and Dunlap 1978, p.45).

Michael Redclift finds that in their approaches to development, social scientists working out of both Marxist and non-Marxist frameworks have ignored the physical dynamics and finite limits of the natural resource base (Redclift 1987, p.4). As a result, he asserts, development strategies have themselves been responsible for accelerating environmental degradation in the the Third World. He urges social scientists to work toward further conceptual integration of environment and development.

An excellent example of this integrative approach is Bunker's chronicle of spiraling environmental degradation and human impoverishment in the Amazon Basin. Through a historical analysis from the Conquest to the present, Bunker shows how "local classes reorganize modes of production and extraction in response to changing opportunities and political actions in the world system" (Bunker 1984, p.1022), and how each social formation sets the parameters (ecological, demographic, organizational, infrastructural) for subsequent modes of production and/or extraction. The ecological consequences of each historical social formation

set limits on subsequent structural options. Bunker's analysis demonstrates Norgaard's assertion that in the world's tropical regions, interactions between social systems and ecosystems are increasingly mutually destructive (Norgaard 1981, p.139).

In considering the social determinants of the present environmental crisis in the Third World², I have found the literature in both political economy and epistemology to be relevant. Here again, many analyses focus on one of these to the exclusion or relative neglect of the other.

From the political economy perspective, environmental degradation in the Third World is seen to be the inevitable consequence of development strategies whose authors and beneficiaries, given existing unequal global economic relations, are the Center nations and their class allies in the Periphery. Solutions to the crisis therefore require fundamental structural transformations. These transformations must occur within three interrelated nexi: relations among developed nations, relations between developed and underdeveloped nations, and relations within underdeveloped nations. Bahro (1982) and Redclift (1984).

²For a description of the elements of the Third World environmental crisis, see Eckholm 1976, Chapter 8. According to the World Conservation Strategy (1980), processes of development that are contributing to environmental degradation include: 1) conversion of cropland to ranching, 2) deforestation by lumber companies, and 3) use of pesticides and chemical fertilizers (Redclift 1984, p.50).

emphasize the need for change in the first two of these nexi; Leonard (1987) focuses on necessary changes within the underdeveloped countries. The linkages among all three nexi are articulated by Galtung (1971) in his "structural theory of imperialism".

Bahro takes the position that the essential first step toward resolving the environmental crisis is disarmament of the world's superpowers, accompanied by the establishment of a New World Economic Order (cited in Redclift 1984, p.53). Redclift argues that the obstacles to solving environmental problems are political, not technical, and they are based on "the structure of demand in the developed countries and their relations with the underdeveloped world" (Redclift 1984, p.20). Redclift's criticism of such international reports on the environment as the World Conservation Strategy (1980) and the Brandt Commission (1980) is their failure to call for the political action necessary to effect fundamental structural change in the world economic order (Redclift 1984:50).

Leonard's analysis of environment and development in Central America shows unequal land distribution within these countries to be a major driving force behind the rate of deforestation. When measured as the percentage of forests lost each year, the rate of deforestation in Central America is the highest in the world (Leonard 1987, p.126). Data from Costa Rica illustrate this process: One percent of all

land holders controls one-fourth of all arable land; nearly 60 percent are squeezed into four percent of the land. Forty-six percent of farms in Costa Rica are too small to meet the minimum needs of a family. This inequality results in an inverse relation between land capability and intensity of land use: "the better lands are used less intensively while the poorer lands are used more intensively" (ibid., p.107). The environmental consequences are increasing soil erosion; siltation of rivers, reservoirs and coastal harbors; land degradation; and, as a result of these, continued deforestation of ever more marginal lands (ibid., p.175).

Leonard concludes that this pattern of land use, arising out of structural inequalities, "undermines some of the most important economic development goals being pursued by national governments and international agencies" (ibid., p.176). It is these same international agencies, however, that are responsible for promoting, through unprecedented credit and technical assistance, the expansion in the 1960's of Costa Rica's beef export industry, the "development" scheme most guilty of increasing land concentration, displacing subsistence farmers and agricultural laborers and setting into motion the disastrous ecological degradation described above (Guess 1977, p.254; Augelli 1984, p.52). The sharply increasing demographic pressures and threats to the environment being felt in Costa Rica's Talamanca canton

are a direct consequence of the expansion of the cattle industry and its social consequences; the highest out-migration in Costa Rica is from the beef-producing provinces, and the most in-migration to the province containing Talamanca canton comes from the beef-producing provinces (Fernández 1976; pp.94-101).

In Costa Rica, as in all regions of the Third World, it is the rural poor who are least benefitted by "development" (Chambers 1983) and whose lives and livelihoods are most imperiled by environmental degradation (Nations and Komer 1984, p.10). Tribal and indigenous people, whose numbers are estimated between 200 and 300 million, are "the single largest group of the world's absolute poor" (Pitt 1980, p. 285). They inhabit the earth's most fragile ecosystems, where they themselves are among the many species endangered by "development". Prospects for their physical and cultural survival correspond to global politics and fluctuations in the world market, as Ribeiro asserts:

The quotation of rubber, nuts and other products on the New York market, or the perspectives of peace or war among the great powers, influence the ebb or flow of extractors of forest products, permitting the last remaining autonomous tribes to survive or condemning them to extinction (cited in Davis 1977, p.18).

To summarize, from the perspective of political economy, environmental degradation is an inevitable consequence of development strategies that fail to challenge

existing structural inequalities in the global economic system; and it is the rural poor, and especially indigenous populations, who are the first to suffer life-threatening consequences.

From a second theoretical perspective, that of epistemology, behaviors toward the natural environment emerge from societies' conceptions of the relationship between human beings and nature. Solutions to the environmental crisis, according to this view, require transformations in belief systems. There are those who postulate the primacy of belief systems, arguing that the world views/religions/cultural ideologies held by a people determine their social formations. Among these are White (1968) and Foley (1977). White asserts that Christianity is to blame for Western society's heedless destruction of nature; Foley argues that, on the contrary, it was the "abstract triumph of science and technology over the bondage of nature and nature's gods [which was] bought at the price of the despoilation of the world's material resources and of our own, both spiritual and physical" (Foley 1977, p.67). White and Foley agree, however, that the causes of the environmental crisis are found in the cultural/religious consciousness of Western man, and that the solution requires what Mumsford said amounts to a "religious conversion" (Fleming 1972, pp.90-91).

The Deep Ecology movement offers just such a new "mental image of social reality" based on the unity of humankind-within-nature, in contrast to the humankind-versus-nature dualism, which has been the dominant theme of Western philosophy. Deep Ecology seeks a "transformation of values and social organizations" (Devall 1980, pp.300-309). Although the movement's major theorist, Devall, has spelled out a 15-point statement of principles, this does not include a fully-articulated political-economic program. Deep Ecology has not yet specified the structural mechanisms through which its alternative visions can be realized, for that step will only follow upon the prerequisite conceptual transformations (ibid., pp.310-315).

One of the nostrums in Devall's prescription for an ecologically sound world view is "a new philosophical anthropology [which] will draw on data of hunting and gathering societies for principles of healthy, ecologically viable societies" (Devall 1980, p.312). A pioneer in this area of inquiry is Roy Rappaport, who analyzes the adaptiveness of tribal versus other "cognized models of the environment". He defines adaptation as:

...processes by which organisms or groups of organisms maintain homeostasis in and among themselves in the face of both short-term environmental fluctuations and long-term changes in the composition and structure of their environments (Rappaport 1971, p.23-24).

Rappaport's concept of homeostasis is consistent with Norgaard's concept of coevolution between social systems and ecosystems, and with the concept of physical and social sustainability. For Rappaport, the ways in which societies respond to changing conditions in the physical environment depend on their understanding of physical ecology, their "cognized model of the environment". It is the "lawful order of nature [which provides the] criteria in terms of which the appropriateness of [cognized models] can be assessed" (Rappaport 1979, p.140). In other words, the criterion of adequacy for a cognized model is not its accuracy, but its adaptive effectiveness (ibid., p.97).

Cognized models of the environment are "false" or "maladaptive" when they lead their adherents to "act in ways that are so at variance with the natural constitution of the world as to make damage to it and themselves inevitable" (ibid., p.140). This criterion leads Rappaport to suggest that "the conventional orders of industrialized capitalism, which must expand to remain stable, have become, if they were not always, inappropriate, infelicitous and maladaptive because they must sooner or later degrade or violate the finite ecosystemic processes over which they exercise domination but upon which they depend" (ibid., p.140). In contrast, the Tsembaga, the tribal group Rappaport studied, have long enjoyed social and physical sustainability, and Rappaport attributes their success to the regulatory

functions of sacred ritual (Rappaport 1984, p.6). In societies that lack powerful authorities, sacred rituals serve as a functional alternative to political power in guiding community decision-making and in maintaining homeostasis (ibid., p.236). Members of such societies may not be conscious of the regulatory functions their sacred rituals serve. Rappaport's observations of these regulatory functions form part of the anthropologist's "operational" model of the environment under study; this operational model and the cognized model of the tribal group:

...are overlapping but not identical. While many components of the physical world will be represented in both, the operational model is likely to include material elements, such as disease germs and nitrogen-fixing bacteria, that affect the actors but of which they may not be aware. Conversely, the cognized model may include elements that cannot be shown by empirical means to exist, such as spirits and other supernatural beings (Rappaport 1984, p.238).

In reflecting on the apparently greater adaptiveness of cognized models that approach nature with "respect" within a sacred context, as opposed to cognized models that approach nature through scientific knowledge, Rappaport writes:

It could be argued that increased knowledge of ecosystems results in decreased respect for them...and thus leads men to be guilty of and subsequently punished for, what might be called ecological hubris. It is perhaps the case that knowledge will never be able to replace respect in man's dealings with ecological systems, for...the

ecological systems in which man participates are likely to be so complex that he may never have sufficient comprehension of their content and structure to permit him to predict the outcome of many of his own acts (1974, p.59).

Few theorists or practitioners of Third World development approach indigenous knowledge systems with Rappaport's convictions as to their practical, even instructive, value. It has been most common for development planners to seek to gain an understanding of native beliefs so that they can put Western concepts into a locally-comprehensible framework, for purposes of diffusion or transfer of technology. A few Western scientists are, however, urging their colleagues to learn what can be learned from indigenous peoples before they carry their knowledge to the grave. Massive ethnocide as a consequence of "development" (as described, for example, by Davis 1977) and acculturation of the younger generations among indigenous societies undergoing rapid change (Clay 1988, p.4) threaten the survival of indigenous knowledge. Botanists are becoming particularly eager to probe indigenous peoples' knowledge of the medicinal properties of plants, given that "half the active ingredients of medicines encountered in an average drugstore originate in tropical rainforests" (ibid., p.5). Researchers from a variety of disciplines are discovering how indigenous agricultural systems have "fewer harmful effects on the soil than other

agricultural practices" (Posey et al. 1984, p.101); they are also found to be extremely productive per unit of labor utilized and per unit of land cultivated (Carneiro 1961, pp.52-53). Preliminary studies indicate that much could be learned from indigenous hunters about wildlife behavior, habitat, carrying capacity and identification of species apt for experimentation in domestication and semi-domestication efforts (Clay 1988, p.14).

In the area of development planning, many practitioners have observed that development is more likely to fail when indigenous knowledge is ignored (Brokensha et al. 1980, p.8). In addition to this negative motivation to incorporate indigenous knowledge into development planning, Brokensha argues that there is also a broad range of positive reasons for doing so:

...it is a courtesy to the people concerned; is an essential first step to successful development; emphasizes human needs and resources rather than the material ones alone; makes possible the adaptation of technology to local needs; is the most efficient way of using Western "Research and Development" in developing countries; preserves valuable local knowledge; encourages self-diagnosis and heightens awareness; leads to a healthy local pride; can use local skills in monitoring and early warning systems; involves the users in feedback systems...(Brokensha et al. 1980, p.8).

Brokensha suggests that development theorists and practitioners should seek to approach development through a

synthesis of traditional ways of knowing and Western science. Warren points out that although even government bureaucrats and international lending institutions have for some time been giving lip-service to the importance of including rural people and their knowledge systems as participants or factors to be included in development planning, "one will search virtually in vain...for adequate mechanisms which might allow for such integration..." (Warren 1980, p.369). Farming Systems Research has attempted, with some success, to formulate and implement such mechanisms. In his assessment of FSR and similar approaches, Robert Chambers finds that the major obstacle to integration is the fact that the two knowledge systems are

...grotesquely unequal in leverage. Modern scientific knowledge is so strong, so enmeshed with the power of the State and of State functionaries, and so embedded in the conditioning imparted by academic training, that only sustained reversals can achieve [an optimal mix of the two knowledge systems] (Chambers 1979, p.3).

Howes and Chambers observe that when indigenous and Western scientific knowledge come together, usually

...synthesis does not occur. One of two things tends to happen; either the two sets of knowledge are isolated from each other...or ITK [Indigenous Technical Knowledge] is ignored and squeezed out as inferior. This squeezing out is more common and can lead to loss of confidence among the

possessors of ITK as well as to irreversible loss of knowledge (Howes and Chambers 1980, p.332).

Even when Western scientists acknowledge the value of indigenous knowledge, ethical problems often arise. Chambers warns that Western scientists who "mine" indigenous knowledge fall into repeating

...the familiar pattern of dominant outsiders extracting new materials, in this case nuggets of information, to be processed somewhere else and then used to act on the rural environment from outside, rather than enhancing the control and capabilities of the rural people themselves. Less obvious, but perhaps more important, are the processes whereby knowledge is generated, communicated, adapted, incorporated and transmitted, and who controls all this. There are degrees to which rural people can participate in and control these processes (Chambers 1979, p.1).

The power differential between indigenous knowledge systems and Western science is a little-recognized aspect of structural inequalities in the world system. It is a form of domination in which Western researchers take part, although few recognize it:

The dominant view of social transformation has been preoccupied with the need for changing existing oppressive structures of relations in material production. But...the gap between those who have social power over the process of knowledge generation and those who have not, has reached dimensions no less formidable than the gaps in access to means of physical production For improving the possibilities of liberation, therefore, these two gaps should be

attacked, where ever feasible, simultaneously (Muhammed Anisur Rahman, cited in Gaventa 1985, p.28).

In his analysis of the "political economy of the knowledge society," Gaventa describes how "the knowledge elite" has the power to define the acceptable topics for research, the methods by which knowledge is produced (Western science), the technology through which knowledge is produced and disseminated, the relations between the researchers and the researched, and the people who will and will not have access to the knowledge thus produced and disseminated (Gaventa 1985, pp.1-25). Conscientious social scientists have criticized the knowledge power structure of which they are a part and recommended structural reforms (e.g., Chambers 1983, pp.168-89); and some have developed methodologies that aim to reduce the inequalities between themselves and the subjects of research by altering both the social relations among the people involved and the objectives of the research. One such methodology has come to be known as Participatory Action Research (PAR).

The discussion of theoretical issues that link environment, development and indigenous knowledge systems thus leads to considerations of appropriate research methodologies through which researchers concerned with environmentally and socially sustainable development can work productively with indigenous peoples in ways which

enhance such peoples' cultural and physical survival and produce knowledge that can inform sustainable development strategies. In the next chapter, the Participatory Action Research model is outlined as a methodology which responds to these theoretical issues and ethical concerns, and its application in the Cocles Indian Reserve Project is described.

III. THE PARTICIPATORY ACTION RESEARCH METHODOLOGY

A. The Model

The roots of Participatory Action Research (PAR) are found largely, though not exclusively, in the Third World, in the andragogical education-for-liberation philosophy and techniques of Brazilian Paulo Freire (1970), in the "people's science" movement articulated by Colombian Orlando Fals Borda (1985), in Dependency Theory, Liberation Theology, and in community and agricultural development work in Asia and Africa (Brown and Tandon 1983, pp.278-79). As a research model, PAR is new; an international network of its practitioners was formed only in 1978, under the sponsorship of the International Council for Adult Education (ibid., p.279). Although a great deal of experimentation, debate and refining of concepts is ongoing, the following set of principles is upheld by all who would call themselves Participatory Action Researchers (adapted, in part, from Hall 1981, pp.7-8; and Tandon 1981, pp.24-26):

1. The pursuit of knowledge is linked to concrete action. Knowledge thus produced is immediately useful in solving social problems, and social action is informed by the knowledge generated.

2. An existing problem in a community provides the

initial motivation for engaging in Participatory Action Research. While persons external to the community may initiate discussion of the problem or may become involved in later stages, the community itself is collectively in control of the definition of the problem, the selection of research methods, analysis, dissemination of the knowledge generated and ensuing social action.

3. The ultimate goal of research is the transformation of social reality and the improvement of the lives of the people involved. The beneficiaries of the research are members of the community itself.

4. The awareness in people of their own abilities and resources is strengthened, and mobilizing or organizing for social action is supported.

5. The term "researcher" applies to both community members and those with specialized training. The term "knowledge" applies to understandings of social and physical phenomena arrived at through empirical and indigenous ways of knowing.

6. "Outside" researchers are committed participants and learners in a process that encourages active solidarity rather than detachment.

7. Through the research process, all those involved in it become more knowledgeable about methods of knowing and analysis, about the structural components of their own situation and about possible ways to change that situation.

Participatory Action Research projects consist of three essential components: knowledge-generation, broad-based community education, and social action. Projects may vary, however, according to the relative emphasis placed on one or another of these components. Other differences among PAR projects are found in:

1) their organizational structures: they may be managed by existing political bodies such as town councils, school boards, political parties and religious organizations; they may create new organizations or alliances among existing ones;

2) their affiliations: they may be tied to regional, national or international networks, or they may be entirely autonomous;

3) their sources of funding: they may operate on an entirely voluntary basis with no funding at all; they may generate funds by sponsoring such local activities as bingo or social events; they may receive funds from their affiliated organizations or through grants from international foundations and agencies;

4) their duration: they may organize around one specific community problem and disband upon reaching a solution, or, if their objectives are long-range and multifaceted, they may continue indefinitely;

5) their ideologies: groups that espouse conflict social theories will differ in their means and objectives

from groups that seek reforms through consensus.

Many community efforts that come to be called Participatory Action Research by outside observers and/or by participants, evolve spontaneously from the unique set of circumstances in which communities find themselves and the coincidental presence of or contact with "outside" social scientists or activists. Variety among projects is also due to this "spontaneous emergence" phenomenon.

Participatory Action Research can be critiqued from two camps: from social scientists who operate within the dominant social research paradigm, whose questions are, "is it really research?" and "is it effective in producing knowledge?", and from radical working class organizations and activists whose concerns are, "is it really participatory?" and "is it effective in producing social change?"

Advocates and practitioners of Participatory Action Research respond to challenges from within the dominant social research paradigm with their own critique of that paradigm. Tandon (1982, p.80-94) summarizes this critique with the following points:

- 1) The dominant social research paradigm (DSRP) claims to be the exclusive vehicle to discovering the "truth" about social phenomena. In fact, since the reality of social phenomena is socially constructed, no claim to exclusivity can be justified.

2) The DSRP does not concern itself with the usefulness of generated knowledge. This leads to research which is irrelevant, or, when relevant, it is not necessarily applied toward the solution of social problems.

3) The DSRP purports to be "objective." In fact, the researcher's presence, actions, social relations and biases do influence the outcomes of DSRP research.

4) The DSRP ignores ways of knowing other than strictly rational, abstract conceptualization and observation. Human beings also learn and know through their feelings, sensory perceptions, concrete experiences and by acting and experimenting within their environments.

5) The DSRP is elitist in its denial of access to the tools and results of research to people outside the academic disciplines.

Participatory Action Research essentially deflects criticism based on the dominant social research paradigm by adopting a different set of objectives which require different social relations and methodologies for their realization.

The second focus of criticism of the Participatory Action Research model ("is it really participatory?"; "is it effective in producing social change?") also presents legitimate and important questions. Among these is the potential for manipulation of indigenous groups by activist social scientists. It is important to recognize that this potential exists, although manipulation certainly runs

contrary to PAR's principles of community control and the bolstering of self-reliance. PAR as a model is too new to have established a clear track record of its effectiveness in realizing social change objectives. There is a need for systematic evaluation of the outcomes of PAR projects.

Through such studies, it should become possible to identify key components of successful PAR efforts, which can then be incorporated to strengthen the model.

A final issue needs to be addressed. In recent years the concept of "community participation" has become very popular in development circles. Even such institutions as the World Bank and USAID urge community participation in development schemes which originate in their Washington D.C. offices (Warren 1980, p.369). It is important to assess the purposes of local peoples' participation in development; McCall (cited in Swantz and Vainio-Mattila 1988, p.131) suggests that community participation can be used:

- 1) as a means to facilitate and lubricate outside interventions and policies, or
- 2) as mediation, that is, a means to modify, guide or redirect interventions, and
- 3) for empowerment of the weakest groups, in which case it becomes emancipating and liberating.

Research projects that fall into the first two categories must not be construed as Participatory Action

Research. In my own analysis of the Cocles Indian Reserve Research Project, which follows, I have been careful to distinguish the project's original methodology (applied ethnography, whose purpose is best represented in McCall's second category), from Participatory Action Research, into which the project evolved.

B. The Cocles Indian Reserve Participatory Research Project

This project began as applied ethnography and became Participatory Action Research. The stated purpose of the project, as expressed in the letter of agreement between the funding agency, Cultural Survival, Inc., and the sponsor, ANAI (October 26, 1986), was:

...to gather and record oral data from the Cocles Bribri Indians; this will include general cultural information, but will focus on indigenous concepts of land and natural resources and their management. This information will then be edited and published....This material and the Indians themselves will be integrated into the development and implementation of the resource management plan for both the [Wildlife Refuge] and the buffer zone [the region surrounding the Wildlife Refuge, including the Cocles Indian Reserve], allowing Indians to continue to exploit the resource base without destroying the natural environment.

From conversations with ANAI's directors, my understanding was that ANAI's main interest was to learn from the Cocles people 1) general information about the current status of forest resources and wildlife within the 3,500-hectare Reserve; 2) the extent to which the Cocles people perceived their natural resources to be a) important, b) threatened, and c) if threatened, how so?; and 3) the potential for incorporating the Cocles people into long-term regional planning and cooperation for natural resource

conservation in the region. Cultural Survival's main interests were to assist the Cocles people in defending their land rights and in articulating their concerns and policy positions regarding the use and conservation of natural resources within their Reserve. The proposed methodology for data gathering (assuming permission would be granted by the governing Junta of the Cocles Indian Reserve) was for me to conduct interviews within the Reserve, with the collaboration of the Cocles people. The expectation was that this data would then serve as the basis for discussions between ANAI and the Cocles people about potential areas of collaboration that would be to their mutual benefit. I would write a report of the oral history data and the resultant policy agreements, which would be distributed to other Indian groups, non-Indian communities in the region and appropriate national agencies. This research approach could be called applied ethnography.

1. Preliminary steps

Before contacting anyone in the Cocles Reserve, I spent several weeks in the nation's capital collecting relevant documents (the national Indian Law, the legislation which established the Cocles Reserve, maps, etc.), and published studies and unpublished theses about the Bribri tribe. I also interviewed government officials at CONAI (Comisión Nacional de Asuntos Indígenas, the Bureau of

Indian Affairs equivalent agency) and anthropologists who had studied the Bribris. I learned that the Cocles Reserve had been entirely passed over by anthropologists and researchers from other disciplines who had conducted their studies of the Bribris in the much larger and geographically more isolated Talamanca Reserve. They assumed that the Cocles people were far more acculturated than the people of the Talamanca Reserve. Relations between the Cocles Junta and CONAI had been interrupted for nearly a year, due to political battles in which the Cocles Junta supported the political opponents of the faction which controlled CONAI. At CONAI I was able, at least, to learn the name of the Cocles Junta's president, Ronulfo Paez.

A few days after I returned to my home in Puerto Viejo, from which I could walk to the northern boundary of the Cocles Reserve in about 20 minutes, I was able to identify Ronulfo Paez at a regional meeting with one of the province's congressmen. After the meeting I introduced myself and learned that don Ronulfo³ knew of my oral history work with students at the regional high school. He asked me why we had never interviewed anyone in the Cocles Reserve,

³Here and throughout this paper, the Spanish terms "don" and "doña" preceding the person's first name, are used to denote respect afforded the person because of his or her age, social position and/or marital status (married). With Gloria Mayorga and Juanita Sánchez, unmarried women of my own age group, a close friendship developed, such that among us the formal term "doña" was never used.

and I told him it was because no students from Cocles attended the high school. He corrected me: the first Cocles student had just entered. We began talking about education; eventually I told him I had been wanting to meet him to discuss the recently-established Wildlife Refuge (which was a controversial topic locally) and to talk about environmental issues in general. I explained that ANAI had funds to support a study of the Cocles people's environmental policies and problems. It had been a cordial first meeting; don Ronulfo invited me to meet with the Cocles Junta that same week.

Although there are only seven official members in the Cocles Junta, meetings are held in the Casa Comunal, and often 30 or 40 additional people walk as many as 20 kilometers of the Reserve's muddy trails to participate. There is no population center in Cocles; the Reserve's 160 people live on individual or family farms spread out through the lower altitudes of the 3,500-hectare area. No one in the Reserve owns a horse or mule; all communication is by foot. The most direct path to the Casa Comunal from the coastal road at the northern boundary of the Reserve is an hour's climb through cacao plantings shaded by enormous trees. At the top of the mountain, the Casa Comunal overlooks the Caribbean.

After explaining ANAI's concerns about the Wildlife Refuge and their interest in the Cocles situation, I asked

the Junta members if they were concerned about natural resource conservation within their Reserve. The question elicited a flood of complaints about non-Indians illegally entering the Reserve day and night to hunt; about squatters moving onto Indian lands and clearing hectares of forest before they could be stopped; and about the sluggishness and/or outright negligence of regional authorities in enforcing the Reserve boundaries and the rights of the Indian population. Further questioning by me led the Indians into discussions of the deeper concerns that fed these complaints: behind their complaint about non-Indian poachers was the realization that much of the wildlife had already disappeared from the region (in view of this, they had placed voluntary restrictions on their own hunting); behind their complaint about land invasions was anxiety about losing the forest (home of animals, medicinal plants, plant species necessary for construction and handicrafts, and the setting which forms their identity as human beings in relation to nature); behind their complaint about the authorities' lack of support was their perception that their non-Indian neighbors know and care little about the Indians' philosophy, livelihood and legal rights.⁴ As they talked, their words and their faces expressed anger, exasperation and fear. When I asked them what they thought were the best

⁴See Chapter IV for narratives in which the Cocles people express these concerns in detail.

strategies to deal with these problems, some argued for an educational approach to the non-Indian communities surrounding the Reserve, others for a more confrontational, legalistic approach to better enforcement of Indian rights. The general consensus was that both strategies had merit and should be carried out simultaneously. At dusk, we agreed that I should meet with Junta members again in several days' time to come up with a work plan which would be presented for a vote at a General Assembly meeting in two weeks.

I was surprised at how fast things were moving. The driving force was certainly the Cocles peoples' desperation to halt the assaults on their land and resources. Lacking the support of CONAI as well as of local authorities, experiencing conflicts over hunting and Reserve boundaries with non-Indian neighbors on all sides, having 3,500 hectares of land to defend and only about 60 able-bodied adults to defend them, having no money at all in the communal treasury (not even enough to pay bus fares for members carrying complaints to the regional police), they needed allies. Although we didn't know each other, they knew enough about my previous oral history work with Indian and Black students at the high school to give me the benefit of the doubt. For my part, I was impressed with the lively voluntary participation of women and men, young and old, in the day's discussions, and I was moved by their ardent expressions of concern about the environment.

2. Project planning

When we met again, Board members had taken the position that ANAI's proposed study could be helpful to the Cocles people in both aspects of the strategy they were developing to protect their natural resources: they could use the data gathered in an educational format to communicate their concerns and their rights to their non-Indian neighbors and to local authorities, and ANAI's backing might be useful to them in upgrading their enforcement of Reserve boundaries and policies. We drafted an agreement that spelled out objectives, tasks and the responsibilities of the Cocles Junta, myself and ANAI.

When don Ronulfo and I presented the proposal to the Cocles General Assembly on December 7, 1986, people from all parts of the Reserve attested to their conflicts with poachers, squatters and authorities, and promised to collaborate in the study. The proposal was approved unanimously; four members of the Junta (Juanita Sánchez, Gloria Mayorga, Práxedez Lazo and Tranquilino Morales) were named as a Task Force to work directly with me as guides, translators and advisors for the duration of the project. My offer to pay these collaborators was flatly rejected. They saw themselves working for the Reserve, not for me or for ANAI. The impact of this principle would eventually combine with other factors to transform the research project

from applied ethnography promoted by sympathetic outsiders to Participatory Action Research, controlled by the Cocles people themselves.

My agenda for the first Task Force meeting the following day was to familiarize the Indian collaborators with the use of tape recorders and to think through the tasks ahead of us: what kind of information did we need to gather? Which Cocles residents would be our key informants? The Indians' agenda was to establish their priorities and bring me into their way of thinking about the environment. They said the first person we needed to talk to was don Adán, a very old man who lived alone in the highest, most remote dwelling in the Cocles Reserve, and we needed to ask him how Sibö created the earth. I put my lists of topics aside and let the Bribri way of knowing guide our initial interviews. After all, I reasoned, the Indian collaborators had a much clearer vision than did I of the content of the data we were setting out to gather.

3. Data Collection

Over a two-and-a-half-month period, Task Force members and I crisscrossed the Cocles Reserve together to conduct in-depth interviews with 15 key informants; we met with many of these informants on two to four different occasions. Interviews were conducted in a mixture of Bribri, Cabécar

and Spanish, and all were taperecorded. Often additional interested Indians accompanied us or, if they were present at the home of the informant, also joined in the conversations. Some special excursions were planned (e.g., to cut palm bark and thatch leaves to demonstrate construction practices); others occurred spontaneously when an informant offered to show us the way, for example, to the stand of sacred trees at the source of the Cocles River, used in former times to make the carved staffs of the tribal chiefs, and "untouchable" to the Cocles people to this day.

A special task was taken on by the young Cabécar sukia (shaman), Anibal Morales. Don Anibal is a passionate defender of the forest, for it provides him the animals and birds whose skins, bones, organs and feathers are needed for spiritual curative purposes, as well as the medicinal plants he was trained to use. When I suggested to him that sharing his knowledge of the medicinal properties of the forest plants with botanists at the National Museum (without revealing the secrets of his spiritual training) might draw the attention of the national scientific community to the importance of defending the Cocles Reserve's forests, don Anibal agreed to bring the plants he could collect to my house in Puerto Viejo. I passed on to don Anibal the National Museum botanists' instructions for plant collection and pressing procedures; he followed them carefully, and I recorded his descriptions of where the plants are found as

well as their proper preparation, doses and expected effects. Since don Anibal is paid for his professional services to the Cocles community, the Junta agreed he should be paid for this service.

Early into the data collection phase, control of the research process shifted from ANAI and myself to the Cocles people, represented by the Task Force members. This shift came about largely from the content and quality of the data itself, and from my own and the Task Force members' responses to it. The first interviews were, for me, an introduction to the Bribris' "cognized model of the environment"⁵. The Indian collaborators not only translated words from the Bribris and Cabécar languages to Spanish; they had to interpret cultural concepts from the Indian cognized model in terms that they thought I could understand. They were young people, ages 23 to 35, who were grounded in the Bribris cognized model (although they learned a great deal that they had not known before about Bribris "history" from the elderly informants), but they had also attended Spanish elementary schools and Catholic churches (Juanita and Gloria even taught First Communion classes in Puerto Viejo); in their daily lives as well as in our research process they moved back and forth between the indigenous cognized model

⁵The Cocles people made no distinction between Bribris and Cabécar cosmologies. In this paper the Bribris cognized model is assumed to be the same as the Cabécar cognized model.

and that of the dominant Hispanic, Judeo-Christian society. They could guide our research far better than could I, for they had a grasp of the depth and breadth of Bribri cosmology that I lacked. Indeed, their essential first task was to provide for my education in the Bribri way of knowing; if I could learn to comprehend the Bribri world view, I could help them communicate it, as well, to the larger public they needed to educate.

The data itself was fascinating to me. As the Task Force members and I got to know each other on our long treks through the farms and forests of the Cocles Reserve, as we revealed more of our inner selves to each other in response to the experiences we were sharing, and as we reflected together on the meanings and significance of the data we were gathering, we began talking in terms of writing a sort of "Cocles environmental manifesto". The Task Force members knew I had written books; they wanted me to help them write their story. They had two purposes in mind: 1) to reinforce among Cocles young people and future generations, knowledge of and pride in their Indian heritage, in other words, cultural revitalization in the face of rapid change in their social environment, and 2) to communicate to non-Indians their beliefs, their knowledge and the Junta's natural resource management policies, in an attempt to win their neighbors' respect and cooperation. I knew ANAI didn't have sufficient funds to publish such a book, but the Cocles

Junta and I committed ourselves to securing additional funding to realize this goal. We also decided, on my suggestion, to develop a slide show which the Cocles people could present in area schools and communities as an educational device and as a basis for discussions about Indian rights and environmental policies. In my own mind, I was no longer working for ANAI; I was working for the Cocles Junta. Our goals were consistent with ANAI's purposes and with the terms of Cultural Survival's grant, but the Cocles Junta was in control of the directions our work would go. The project took on a mission of its own. It had become Participatory Action Research.

Through the months of December 1986 and January 1987, we gathered data that fell into these broad topics: Bribri "history" (the Bribri cognized model of the relations between humankind and nature); biographies of Cocles' oldest residents and founding families; history of the establishment of the Cocles Indian Reserve and its status within Costa Rican law; observations on the disappearance of wildlife and other threats to the environment within the Reserve; the Cocles people's dependence on natural resources for food, medicine, construction, crafts, etc.; and contemporary political organization within the Reserve and policies for the protection of natural resources. I made a photographic record of our work with both black and white print film and color slides.

4. Data Analysis

Our first task was to transcribe the interviews recorded on twenty-five 90-minute cassette tapes. I worked on the Spanish transcriptions; Gloria Mayorga and Juanita Sánchez later revised and corrected these transcriptions. They also translated the oral data in Bribri and Cabécar into written Spanish. We decided it would be important to use the Bribri and Cabécar words for place names, plants, animals and spiritual beings in our book. Costa Rican linguists had only recently formalized written forms of these languages; I asked the Bribri scholar, anthropologist Maria Eugenia Bozzoli, to teach us how to write the two languages. In the space of an afternoon at my house, Gloria, Juanita and Práxedez learned to convert the complex sounds (six for each vowel, for example), into letters (e.g., a, ɐ, á, à, ä, a').

When all the interviews were transcribed and corrected, I made a xerox copy of the hundreds of pages, so that one set would remain intact while we cut and pasted the other for our book. I explained to Gloria and Juanita how I had learned to organize the material for my previous books, following the coding methods of Grounded Theory (Charmaz 1983, pp.111-20). As we read through the transcripts, we wrote in their margins phrases that described the content,

e.g., "Bribri rules about hunting tapirs," "squatter invasion, June 1980," "use of vines in construction," "how Sibö created the Sea." This task is the initial coding process, through which conceptual categories emerge from the data. Then, on 3x5 cards, we copied the categories, one category per card, and noted the transcript page numbers on which each category appeared. We sorted the cards into stacks representing broader categories that made sense to us, e.g., "Human-animal relations"; "Indian versus non-Indian conflicts"; "uses of plants"; "the origins of all things". We thought about our purposes in writing the book: what questions did we want to answer? We moved into the "focused coding" phase as we examined our data categories analytically. Through trial and error we rearranged our cards and our categories until they corresponded to the questions we sought to answer. This gave us an outline for our book. (See Figure 1 for a translation of the book's Table of Contents.) We then selected the narratives that should be included in each section. We attempted to include narrations by all the people we had interviewed so that all would feel rewarded for their collaboration.

I wrote a first draft of Cuidando los Regalos de Dios: Testimonios de la Reserva Indígena de Cocles/KéköLdi ("Taking Care of God's Gifts: Testimonies from the Cocles/KéköLdi Reserve"). Juanita Sánchez and Gloria Mayorga made their revisions and then submitted the draft to

- I. What does it mean to be Indian?
 - A. Indians belong to a clan
 - B. Indians speak their own language
 - C. Indians have their own history
 1. How Sibö created Indians
 2. How Sibö created the clans
 3. How Sibö created the Earth
 4. How Sibö celebrated the creation of Indians
 5. Differences between Indians and white people
 - D. Sibö made laws for Indians regarding their use of flora and fauna
 - E. Indians want to maintain their customs
 1. The work of the sukia (shaman)
 2. The /tsrik/ cure
 3. When an Indian dies
 4. The spiritual significance of cacao
- II. How did indigenous people establish themselves in the Cocles/KéköLdi region?
 - A. Trips to the seaside from the high Talamanca mountain region
 1. The Indian concept of the sea
 2. Uses of seashells
 3. How Indians made salt
 - B. The first Indian settlers in the Cocles region
 1. The history of don Adán
 2. The history of don Felix
 3. The history of doña Enriqueta
- III. Why and how was the Cocles Indian Reserve established?
 - A. The laws and decrees
 - B. The boundary conflict
 - C. Why the Cocles/KéköLdi Reserve is important
- IV. What are currently the most important projects of the Cocles/KéköLdi Junta?
 - A. Define and defend the Reserve boundaries
 - B. Stop illegal hunting within the Reserve so that the animals will return and reproduce
 - C. Protect the remaining forests and the natural resources on which the Indian people depend for their livelihood
 1. Materials for constructing houses
 2. Uses of vines
 3. Materials to make string bags
 4. Materials for making blankets
 5. Medicinal plants

Figure 1. Translation of Table of Contents, Cuidando los Regalos de Dios: Testimonios de la Reserva Indígena de Cocles/KéköLdi.

all the members of the Cocles Junta, who also revised and then approved the manuscript. The Junta appears in the book as the sponsoring organization; Gloria, Juanita and I are co-authors.

5. Data Application/Utilization

Within the framework of Participatory Action Research, the use of knowledge generated through the research process is an integral aspect of methodology. In the Cocles project, two specific products -- a book and a slide show -- contain the knowledge generated by the research. These products are the property of the Cocles people, who are using them in various ways to further their goals. In addition, the Participatory Action Research process facilitated other kinds of learning which also have ongoing impacts within the community. I will summarize these first.

a. Outcomes of the Learning Process

(1) Gloria, Juanita and Práxedez learned to write their own languages. Within a week all the signs within and those marking the boundaries of the Cocles Reserve (originally written in Spanish) appeared in Bribri

and Cabécar translations. Carved gourds which are sold to coastal tourists appeared with Bribri names accompanying the carved animal figures. The anthropologist who taught the writing skills invited the Cocles people to submit to the University of Costa Rica narrations written in Bribri, Cabécar or Spanish for publication in an Oral Traditions series. It is not within the scope of this paper to postulate all the benefits that may accrue to the Cocles people as a function of acquiring literacy in their native languages, but it is without a doubt empowering (Freire 1970).

(2) The name of the Reserve was changed to the Bribri word KéköLdi. As we asked elderly residents to give us the original Bribri names for local rivers, mountains and other landmarks and explain to us their meanings, we began referring to these locations among ourselves by their Bribri names. The Cocles Reserve was named by persons unknown for the major river whose source is found in the uppermost part of the Reserve. The Bribri name for this river is KéköLdi, for the tree from which the tribal chiefs' staffs were made, and which grows at the source of this river. Through our discussions, the Indians resolved to reclaim the Bribri name for their river and for the Reserve.

(3) Task force members, moved by the narrations

of the elderly informants, began inviting the oldtimers to tell Bribri and Cabécar "histories" at meetings of the Junta and the General Assembly and at the school, as part of a cultural revitalization effort. The Junta resolved to conduct its meetings in Bribri rather than in Spanish to encourage elderly non-Spanish speakers to participate fully and also to demonstrate to young people, by their example, that they should be proud to know and use their native languages.

b. Outcomes of the Book and Slide Show

(1) The slide show was the first product of the research. Práxedez, Juanita, Gloria, don Ronulfo and I put it together; we held our first showing of it for the KéköLdi people and ANAI staff. The director of the Wildlife Department of the Ministry of Natural Resources and a Wildlife Management professor from the National University came along with ANAI personnel. The show's demonstration of the poaching problem and the Indians' concern about the disappearance of the region's wildlife elicited an immediate response from the Wildlife Department director. He offered to train and certify up to ten KéköLdi people as Wildlife Inspectors, thus augmenting their real and symbolic authority vis-a-vis non-Indian trespassers and the local police. Several months later, five Indians had completed

this training and received their carnets. They were coordinating activities with similarly trained inspectors in ANAI's Wildlife Refuge. In December 1988, Junta members informed me that since the Inspectors began patrolling, there had been a 100 percent response rate on the part of local police to complaints filed by the Inspectors. Poaching violators had been promptly and severely fined, and several of the previously most persistent poachers had not trespassed the Reserve for quite some time. The KéköLdi Junta considered the Inspector assignments to be a great success.

(2) The professor who saw the first slide show also followed up by inviting the KéköLdi people to give a presentation at the National University. This became Gloria Mayorga's first trip to the capital city and her first experience in public speaking.

This presentation was followed a month later by an invitation to present a paper at a conference where reports would be given on various research projects being conducted in Costa Rica's Atlantic zone. The invitation from the University of Costa Rica came addressed to me. I accepted on the condition that the invitation be extended to Gloria, Juanita and myself: we would give a joint presentation in which I would discuss our methodology and the Indian women would present the data. These conditions were accepted. We

submitted a co-authored paper, but at the Conference we noticed that only my name appeared on the program.

In the session on research in indigenous communities, Maria Eugenia Bozzoli gave a talk on her interpretations of Bribri narratives; other social scientists, agronomists and "development" specialists reported on their research activities in the various Reserves, and then I introduced our work in KéköLdi and handed the microphone to Gloria and Juanita. For these women, who have a total of five years of elementary school education between them, this was a breakthrough in a number of ways. Two Indian people had gained entree to the academic circle where the lives of their people had for years been discussed in their absence. Their confidence in their ability to meet this challenge had been fortified by their participation in the management of a research process. At this point in time, they had also co-authored a book which had been accepted for publication by Costa Rica's major university. They spoke as Indians, but also with credibility as researchers confident of the significance of their data, and as committed designers of an ongoing strategy to address the concerns of their community. Their presentation was received with a standing ovation. It generated, the following day, a lively discussion of the methodologies and prospects for Participatory Action Research in various academic disciplines.

(3) On February 1, 1987, when I submitted my first written report to Cultural Survival, Inc., I included a request signed by the KéköLdi Junta asking for additional funds to publish the book we envisioned. By March 1, we learned that Cultural Survival not only could not increase our funding; it would be unable to make its second scheduled payment to ANAI for lack of funds. The Task Force members and I resolved to continue our work on the manuscript and seek funding by other means. Our written request to the Vice-Rector for Social Action at the University of Costa Rica, mediated by anthropologist Maria Eugenia Bozzoli who was then a member of the Faculty Council, was approved in June 1987. The 58-page book, illustrated with my photographs and Juanita Sánchez's drawings, was completed a year later. The Vice-Rector of the University himself led a delegation to the KéköLdi Reserve to deliver 600 copies to the Junta. Sales of the book, managed by the Junta, are generating income for the Reserve's treasury.

(4) ANAI is working with the Junta to organize community-based discussions of the book and presentations of the slide show in the villages surrounding the Reserve. Both organizations, ANAI and the Junta, have been cautious about their approach to the coastal Black communities, where a dispute over Reserve boundaries has sharpened tensions. The conscientization of the Indian population, facilitated

by the Participatory Action Research process, has apparently been perceived as threatening by some sectors of the area's Black and Hispanic populations. As the KéköLdi people continue to assert their rights and articulate their environmental policies, increased ethnic polarization may be a byproduct, at least in the short run.

c. Other Outcomes of the Participatory Action
Research Project

(1) A series of meetings between the ANAI staff and the KéköLdi Junta, in which the results of the research were analyzed, generated two ongoing collaborative efforts. ANAI proposed that the KéköLdi people manage Costa Rica's first experimental semi-domestication of the green iguana. This species was an early victim of over-hunting in the KéköLdi region. If the semi-domestication experiment is successful, the iguanas will provide a ready source of animal protein, reducing stress on the wild population. As of February 1989, 200 baby iguanas had been born at the KéköLdi iguana nursery, constructed with funds from ANAI. They are expecting to produce 1,800 iguanas in 1989 (Bill McLarney, personal communication). In January of this year, KéköLdi iguana project managers donated 20 baby iguanas to the Hispanic community of San Miguel, at the southeast edge of the KéköLdi Reserve. The experienced Indian technicians

are giving technical assistance to the San Miguel participants, an arrangement which produces, in addition to iguanas, new social relations between two communities that had previously experienced chronic conflict over poaching and invasion of Indian land.

(2) ANAI staff have also helped the KéköLdi people establish, within the Reserve, nurseries for the plant species most utilized in Indian construction and crafts.

(3) Botanists at Costa Rica's National Museum have scientifically identified the medicinal plants collected by the KéköLdi shaman. One specimen took them by surprise; it had not been known to exist in Costa Rica. It was also learned that the Indians rely for medicine almost exclusively on plant species, especially vines, that only grow in forest canopy environments. This knowledge has been useful to the Indians in their argument for forest conservation.

(4) In December 1988, members of the KéköLdi Junta told me that during the last year, another 30 hectares of the Reserve's forests had been invaded and reduced to pasture, in spite of the Junta's efforts to enforce the Reserve boundaries. The improved enforcement of anti-

poaching laws, however, has given visible results. Several animal species that had practically disappeared from the Reserve are being observed in increasing numbers, among them several kinds of wild pig, pacas, peccaries, wild turkey, white-faced monkeys, parrots and toucans.

In conclusion, the Participatory Action Research methodology which evolved as this project was carried out, has generated scientific and ethnographic knowledge; provided for members of the KéköLdi community numerous opportunities for the acquisition of practical skills and increased self-reliance and ethnic pride; initiated ongoing projects managed by the KéköLdi people for their own benefit; forged collaborative relationships between the KéköLdi people and various government and non-governmental agencies, and achieved some success in its goal of protecting the Reserve's natural resources.

IV. DATA AND DISCUSSION

In this chapter, I will analyze portions of the data gathered during the course of the Participatory Research Project, focusing specifically on how the KéköLdi people conceptualize themselves in relation to the forest and to wildlife. I will also examine the ways in which the Indian co-authors and other informants consciously choose to interpret their own cognized model 1) in comparison to the dominant Hispanic (Judeo-Christian) world view, and 2) in scientific, ecological terms. This will lead to further discussion of "adaptation" and the possibilities for a synthesis of Western science and indigenous knowledge systems, as introduced in Chapter II.

A. The Bribri Cognized Model of the Humankind-Nature Relationship

1. The essence and origin of all things

The Bribri people explain that the perceived world is a reflection of a real world which lies beyond the place of the sunrise. In that real world are found the original perfect, pure substances which are manifested on Earth as plants, animals, stones, human beings, etc. These original substances in the real world "over there" are the lords or owners of their shadows which live "here". In the

real world, the original souls or essences of all things interact on equal terms (Bozzoli 1986, p.3-5). "Over there", plants and animals may take the form of human beings; conversely, beings which are seen as human on earth actually originated as corn seeds and leaf-cutter ants. They are seen by the beings "over there" not as humans but in their original forms (ibid.) Within this perspective, the categories "plant", "animal", "human being", or "stone", have no real meaning, for in the real world any given object perceived on earth may be all of these. Since all things are similar in their origins, it follows that they can also take on similar behaviors.

To introduce this concept to the non-Indian readers of their book, Gloria and Juanita drew some comparisons with the Judeo-Christian tradition, as follows:

Indians Have Their Own History

We have a great history which has been passed down orally from one generation to the next. It is the history that Sibö related to the first Indians, for in those days Sibö walked here on earth with our ancestors, and he told them many things. He told them, for example, how he created the earth and the sea, how he brought the first animals here and how he planted the first trees. He gave the Indians certain laws and set punishments for those who do not obey them.

White and Black people who came to America from other continents brought with them the histories of their peoples, and they taught the Indians those histories. In the Old Testament, God made himself visible to certain people (for example to Adam, Eve and Moses), he told them how he created the earth and he left them the Ten

Commandments. That is how those people learned the will of God.

In the same way, our history teaches us how Sibö wants us to live. For us, Sibö and God are the same. Today many Indians are Christians, but at the same time we want to remember our own history and the laws Sibö left us. Now it is time for us to share our history with our non-Indian neighbors, and we hope they will respect it just as we respect their traditions. All people have their own histories, and they are all of equal value.

There are many immortal beings in our history who are family members of Sibö. They also walked the earth once, and the first Indians knew them. We can no longer see them but they still exist. A few examples are

Shula'kma: the king of snakes
 Itso': Sibö's assistant
 SörkuLa: Sibö's great uncle

We also know that all things that exist on earth have an origin. What we see here on earth as one thing, Sibö sees as another, because he made it. Sibö made Indians out of corn seeds, so for him we are corn.

Indians who know their history know that the things we see here on earth are reflections of another plane of reality which is invisible to us. For example, the poisonous snakes are Shula'kma's arrow; the tapir is Sibö's cousin; the wind is Serke, owner of all the animals; the sea is MnyLtmi, a woman that Sibö turned into the sea; the rainbow is ChbëköL, a snake that used to eat people in the old days; the stones that the shamans use are Sia', Sibö's sister. We have great respect for all these manifestations of God, and we fear them because we know they are more than they appear to be....Dogs, ants, everything that exists on earth are reflections of immortal beings.

The Bribris' behavior toward nature is influenced by two elements of their cognized model of the environment

which are revealed in this text: 1) the essential or original sameness/equality of all things, and 2) the certainty of punishment for transgressions against Sibö's laws concerning the proper relations between human beings and nature.

It would be entirely inaccurate to say the Bribris love nature. They are not romantics. They see themselves existing within nature. They and all other things of nature are equal in that they all have owners in the real world who protect them. The Bribris' behaviors are governed by laws which permit them to make use of the forest's flora and fauna without offending the species' owners, thus avoiding the owners' punitive actions. Their entire cognized model revolves around relations of reciprocity with nature (see below), so that living outside the forest environment is inconceivable.

An illustration of this point was made by Gloria Mayorga when she spoke before graduate students at Costa Rica's National University. As she was describing the differences between how Indians and non-Indians live, she said, "where the white people live, there is nothing". The phrase struck me because I had so often heard Hispanic Costa Ricans who were visiting the Talamanca coastal region for the first time declare, "there is nothing here!". The word "nothing" describes the absence of what one considers to be normal. In the case of Hispanics, artificial environments

are the norm; in their absence there is nothing. For the Bribris, to the contrary, the forest environment is the norm; in its absence there is nothing. Just as we assume our body parts (rarely saying, for example, "I love my legs"), the Bribris assume the forest environment, they do not love it.

2. Perceived Differences Between Indians and Non-Indians

In the following texts, the Bribri speakers attempt to explain parts of their creation myth, supporting their beliefs with empirical evidence and, again, phrasing their beliefs in terms familiar to the dominant Hispanic society.

How Sibö Created the Indians

Sibö made the first Indians from corn seed. He brought the seeds from a place named /suLa'kaska/ (Place of Destiny). He brought seeds of different colors: black corn, white corn, yellow and purple. For this reason some Indians are darker than others and have different colorings, because they were made from different corn seeds. The seeds arrived here on earth at night. We were not born in the day, we were born in the night. For this reason the sukia [shaman] chants to cure our illnesses at night.

--Juan Vargas

Differences Between Indians and Whites/Hispanics

We Indians are not children of God. Sibö is the owner of the Indians, not their father. We are Sibö's property.

White people originated as a powder. Sibö

used this powder to make leaf-cutter ants which he called /ple'kékoL/, which means Origin of the Leaf-cutter Ant. /ple'kékoL/ was a man. White people were brought to earth in the day. That's why we say the white man is more scientific. Sibö gave him the intelligence to do many things that Indians can't do. White people make cars, planes, boats, money, they do many things. But Sibö only taught the Indians to cultivate, to raise animals, to hunt and fish.

--Juan Vargas

There is a big difference between Indians and whites. Look at the leaf-cutter ants, see how hard they work together clearing and cleaning their land. Where leaf-cutter ants live, you don't see a single leaf because they cut all the leaves around and carry them to their huge nests. That's what the white man is like. He chops and chops and chops down everything to make his big cities. Where he lives there is nothing. He chops down everything that is green. Where he lives there are no trees, no rivers, no animals. He works very hard, but all his work is destruction.

On the contrary, the Indian doesn't work so hard. He plants corn, raises animals, lives in the forest. He likes to have the plants, the animals, the birds, the rivers around him. He doesn't want to destroy nature; he wants to live in/with nature.

--Gloria Mayorga

Many times, when columns of leaf-cutter ants crossed the trails we were walking along in the Reserve, the Indian Task Force members would call out, "Careful! Don't step on the little white people!" In their attitudes toward white people, they expressed some ambivalence. They often spoke, as above, indulgently, respecting the right of white people

to live and behave as they were apparently meant to, foolish as their frenzied, destructive activity appears to the Bribris. They also seem to admire the "scientific intelligence" they attribute exclusively to white people, but to which they themselves do not aspire. The idea of "converting" white people to the Bribri world view would never occur to them, since the origins of the two human groups are distinct. As they observed the delight I took in our long treks through the jungle, and the skill with which I negotiated muddy bogs in my knee-high rubber boots, they asked me if I didn't have some North American Indian blood, and they seemed dubious about my negative reply. One of the very old men, Juan Vargas, cannot be persuaded that I am not part-Indian because I was able to blow a clear, sustained note on his ancestral conch shell on the first try.

Within their traditional cognized model, the Bribris cannot conceive of non-Indians who share the basic values of their environmental ideology. Contact with non-Indian environmentalists (ANAI staff, Ministry of Natural Resources personnel, university professors and students) may challenge their conceptualization of white people as leaf-cutter ants (although frenzied activity is certainly the norm among these environmentalists). They can conceive of Indians not behaving as corn seed; these are transgressors who will inevitably be punished according to the principles of reciprocity. There are two young men in the KéköLdi Reserve

who fall into this category because they have served as guides for poachers. The KéköLdi Junta has filed complaints with regional police against these two as well as against non-Indian hunters, and they have been fined. But the Owner of Animals will also take revenge against them.

3. Reciprocity

In the Bribri cognized model, there is a Principal Owner of Animals who is friendly to humans when they have asked for his animals properly, when they remain silent in the forest and when they don't take too many animals or leave them wounded⁶. But there are also spiritual owners of specific animals and plants or groups of species, and these are always hostile to humans. In exchange for the animals that the Principal Owner allows hunters to take and eat, these owners acquire the right to hunt human beings and eat them. A Bribri shaman explained:

If we want to eat animals, then animals have a right to eat us, and since they cannot do it directly, their spirit owners make us sick and we die, and that is how they finally eat us and drink our blood (Arturo Morales, quoted in Bozzoli 1986, p.9).

⁶The following description of reciprocity among the Bribris relies largely on the writings of Dr. Maria Eugenia Bozzoli. See especially Bozzoli 1986 and 1988.

Over-killing and wounding wild animals are experienced as epidemics and diseases in the animal world. Likewise, it is through illness and death that the offended animal owners punish human violators of Sibö's laws.

The Bribri relate to nature according to the principles of balanced and negative reciprocity (Sahlins 1968). Balanced reciprocity is direct exchange in which the return is immediate and must be equivalent in value to the goods received. When Bribri shamans request a successful hunt from the Principal Owner of Animals, they must symbolically exchange the cultivated vegetables owned by humans for the meat of the wild animals. Each edible wild animal has a corresponding vegetable name, for example: tapir=heart of palm, fish=manioc, wild pig=banana (Bozzoli 1986, p.7). The shaman chants to the Owner of Animals an offer of bananas, for example, if the hunters want to hunt wild pig. Since the Owner of Animals also views his animals as vegetables, he is getting paid in kind.

Even when Bribri hunters have propitiated the Principal Owner of Animals, through the intervention of the shaman, the specific owner of the animal to be hunted may not have agreed to the exchange. Hunters, therefore, must attempt to kill the animal without the owner knowing about it. This is a form of negative reciprocity, an attempt to get something for nothing. For this reason, hunters are silent in the forest and tell no one what they intend to do. If a Bribri

man is going out to hunt wild pig, if he says anything at all he will say he's going to gather bananas (and so on).

Since the risks (illness, death) are so great, Bribri people take only as much meat from the forest as their families and neighbors can readily consume. The rules of reciprocity do not apply to domestic animals, but mistreatment of them is punished after death in the form of obstacles on the soul's path toward the Afterlife. They are also punished in the Afterlife for greediness and lack of generosity, if they don't share meat from the forest with their families and neighbors.

The people of KéköLdi recall a not-so-distant past when wild animals were abundant:

About 30 years ago the animals were plentiful here. We always saw many wild pigs, red monkeys, black monkeys and white-faced monkeys. There were parrots and wild turkeys, deer and wild goats. There were tapirs, jaguars, peccaries, pacas. We used to see big hawks that haven't been here now for many years. There were always lots of iguanas, sloths, mountain hens. When we went out to hunt large animals, we could follow the wide trails they made through the forest, because they travelled in groups, not just three or four but up to 200 animals. We would kill one or two at the most, and carry them whole back to the house....

Then the white men from Cartago started coming to hunt here with their big-eared dogs. They would kill maybe four wild pigs, three pacas, and take the meat off to Cartago to sell it, because it was worth a lot of money. They came here every other week to kill more, as much as they could...

The first animal to disappear from here was the wild pig. Afterward, the monkeys and the

peccaries, the deer and the tapirs. The parrots have completely disappeared.

-- Rodolfo Mayorga

The Bribris attribute the disappearance of many species over the last two decades to the Animal Owner's revenge against Hispanic hunters who invaded the forest with a profit motive. The slaughter of wild animals has been so severe that the Principal Owner of Animals, historically a friend to the Indians, finally turned his wrath against humanity:

Sibö's Laws about the Exploitation
of Flora and Fauna

The Principal Owner of Animals is named Serke, and he lives in the sea. The sea is his house. He has a servant named Duarö. Serke sees everything that happens on the earth, everything that we do. So if someone kills animals without reason, Serke sends Duarö to hide the animals, to protect them and to punish the hunter. Serke gets furious when people destroy or abuse his animals; when this happens he refuses to give more.

For example, if a hunter kills an armadillo, and later sees a peccary and he says, "I'd rather have the peccary" and he leaves the dead armadillo there, Serke gets mad seeing how the hunter doesn't appreciate his armadillo.

Or, if a hunter kills a deer and he says, "I only want to take the meat; I'm going to leave the feet and the head," the Owner gets mad because the hunter should carry the whole animal to the house. The tripe and the head are for the dogs. The skin should be saved for the sukias to use in their incantations. No part of the animal should be thrown away.

--Juanita Sánchez

Duarö has all the animals hidden in the forest. They live there in huge corrals, where they have their food, the fruits and everything that they eat. Sometimes Duarö opens the doors and says, "go outside," and so they leave. And then we see peccaries, wild pigs, pacas, fish, shrimp, all the animals, and Duarö permits us to kill them for food, because that is how we have always lived.

But now it's different. Now these white men are out there hunting day and night. They hunt with dogs, with lamps, and they're not content to kill one animal; they keep killing up to four or five big animals, and not to eat them but to sell the meat. When Duarö sees that, he gets furious and he calls all the animals back and he hides them again. He closes the corral doors, and the hunters won't find a single animal. Some people say the animals are extinct, but it isn't so. Duarö has them hidden as a punishment to us.

--Anibal Morales

It is interesting and perhaps auspicious that don Anibal, a shaman, visualizes the location of Duarö's animal corral in the forested part of the newly established Wildlife Refuge.

In their rejection of the Western science concept of extinction, the Bribris hold out hope that animals that have disappeared from the region can be returned if human beings only obey the laws of reciprocity. Prior to the initiation of the research project, the KéköLdi people had already imposed on themselves a voluntary ban on hunting, to propitiate the Owner of Animals. When don Rodolfo Mayorga says, "We have to have virgin forests so the animals can live. We want the animals to multiply. We want them to

return. We have hope and faith that the animals will return", he demonstrates an understanding of the ecological concept of habitat and of natural reproduction, but when he speaks in terms of hope and faith, he is surely referring to the confidence that Duarö will keep his part of the bargain (the traditional reciprocal relationship), if human beings again keep theirs.

The principles of reciprocity also apply to the forest's flora. Precautions are taken when Indians set out to cut palm bark, thatch leaves, vines and other plant materials that they use:

The vines, the thatch leaves, and the mastate [a tree from whose inner bark blankets are made] are also protected. Sibö left these plants for us, to use, but not to waste or destroy. We know that the bejuco de hombre [vine] is the mustache of the snake. If we say out loud that we are going out to cut this vine, we have to be very careful to avoid being bitten by a snake. The snake is always nearby, protecting the vine. If we say out loud that we are going out to cut vines to make baskets to sell, all the vines we find will be damaged by an insect called polilla. Duarö knows what we're looking for so he only lets us find damaged vines. When we peel them they're full of little holes, they break and we can't use them. So it's better not to say anything....

When we go out to cut the mastate tree, we can't eat "dry" foods. We shouldn't eat plantains, tortillas or bread. If we do, it's difficult to peel the inner fibers from the mastate bark. If we only eat soup and other "soft" foods, the work is easy and the mastate blanket turns out beautifully.

Sibö taught us these secrets because he knew we needed to use the vines and the mastate. But he made his laws so that we wouldn't overexploit

these gifts. We have to take care of these resources. When I am out in my farm and I find a mastate tree or guarumo or a leaf used for thatch, I don't cut them, I take care of them.

-- Enriqueta Martínez

Don Adán Fernández, one of the oldest residents of the Kéköldi Reserve, who narrated a number of creation myths, nevertheless constructed his argument against deforestation and poaching in ecological terms, based on his observations:

We need to preserve the forest for water because when the forest is destroyed the rivers dry up. That creek on the Margarita side of the Reserve was a raging river not long ago, but go see it today: it's all dried up. The squatters came in, felled the trees and the river dried up. Now the people there have to dig wells six meters deep to find water where before it was plentiful. We all knew that river when it was deep. Before the squatters came in, it was as big as the Cocles River, yes.

The squatters came in only five years ago, destroyed the forest completely and now there is no water. If these people keep coming in, how are we going to survive? No water. No thatch leaf. No firewood. No animals. Everything cleared off. The squatters have destroyed everything.

We are frightened. These people have already destroyed all the land they had, and now they want to come into the Reserve and destroy what is ours. I've asked them, when I see them out hunting, "What are you going to do when you've killed off every last animal?"

--Adán Fernández

This is the kind of argument ANAI is most comfortable with. Like Klee, the ANAI staff is eager to recognize indigenous people's "store of precise knowledge that may truly be characterized as natural science" (Klee 1985, p. 200). On the other hand, conservation practices whose sources are found in "magico-religious belief systems" are dismissed by many Western scientists as being "inadvertent", as if for that reason they somehow don't count (ibid.) What I find interesting about the KéköLdi people is that they so easily incorporate ecological principles into their cognized model of the environment. They accept that nature has rules and limits that must be observed, and they hold human beings responsible for acting in accordance with these laws. Ecological disasters are man-made, and human action is required to avoid them or to correct them.

B. Discussion

The KéköLdi people are conscious that the sacred rituals and spiritual beliefs that served to regulate their interactions with their natural environment for centuries, are no longer sufficient to maintain homeostasis (in Rappaport's terms). Their Reserve has finite limits. They are surrounded by rapidly expanding non-Indian communities, and their young people are increasingly influenced by non-

Indian ideologies, values and customs. They say their two local shamans are less knowledgeable and less effective than the shamans of old. The Costa Rican rural health program now offers alternative medical attention; CONAI has even arranged for Indians to enroll in the national social security system free of charge. To some extent, the availability of Western medicine has undermined the authority the sukias exercised exclusively for centuries. Juanita Sánchez explains:

We look for a sukia mostly to cure illnesses of the soul, the really serious illnesses whose causes are invisible....We call these illnesses mala sombra [literally, bad shadow]: when a person goes crazy, loses his or her mind and doesn't know what he or she is doing. In these cases, we rely on our sukias. Also on all ceremonial occasions, such as when a girl has her first menstruation. In other cases, let's say when a person has a cough, he can go to a sukia or to a medical doctor, either one.

Most of the babies born to KéköLdi women in the past decade have been born in the province hospital in Puerto Limón, although some women refuse to go there. Doña Enriqueta, who could walk from her home to the nearest clinic in 20 minutes, has given birth to all of her 14 children following the traditional Bribri custom of building a thatch hut for herself where she gives birth alone, later calling a sukia to cure both herself and the baby.

Martin (1978) describes how the people of the Eastern Canadian Micmac tribe lost faith in their own cognized model of the environment when unprecedented epidemics spread through their populations as the Europeans advanced across the North American continent. Thousands of years of accumulated indigenous knowledge were insufficient to halt the devastation of their people; "shamans were powerless to mend the shattered universe" (Martin 1978, p.146). The Europeans brought this disaster but they also brought a "solution", Christianity, which the Micmacs logically associated with the Europeans' power. "The result of this Christian onslaught on a decaying Micmac cosmology was, of course, the despiritualization of the material world" (ibid., p.60). Once the Micmacs had repudiated their traditional role within the ecosystem, the hunt became profane, and the Indian "changed from conservator to despoiler of wildlife", entering into the fur trade with a vengeance (ibid., p.184).

Unlike the Micmacs, the Bribris and Cabécares of the KéköLdi Reserve have been able to maintain their own world view while coexisting with Christians for several generations. Gloria Mayorga and Juanita Sánchez even give First Communion classes. They appreciate the Italian priest who is currently assigned to the coastal Talamanca circuit, because unlike some earlier priests, he encourages them to maintain their native traditions and conceptualizations,

while attending mass and relying on Christ for salvation. A similar blending of Christianity and native religions occurs throughout Latin America.

The KéköLdi people also entered long ago into the regional economy as small cacao producers; they readily adopted the use of rifles for hunting, store-bought clothing, and the Spanish language. Some of them, though not all, ride buses, make telephone calls and listen to transistor radios. Their identity as Indians and the most fundamental aspects of their cognized model of the environment have withstood these gradual accommodations to the dominant society until now, but now they can foresee the possibility that their universe could be shattered -- if they lose the forest. And here they have resolved to draw the line.

The KéköLdi people's strategy to preserve their universe has clear elements of cultural "revivalism" (Wallace 1956): they are encouraging the spoken and written use of Bribri and Cabécar languages and the narrating of traditional "histories" at public gatherings and in schools; through the publication of their book and the presentation of their slide show they seek to define themselves and interpret their environmental policies in terms of their traditional belief system; their decision to rename their Reserve "KéköLdi" is a powerful symbolic statement of the revivalist elements in their strategy. The word is not only

Bribri, as opposed to Spanish; it also connotes the power of the traditional (now vanished) tribal chiefs and the spiritual origin and other-worldly significance of natural objects (the kéköLdi tree, which is "untouchable").

At the same time as they are reviving and reaffirming their traditional cognized model, the KéköLdi people have chosen to pursue their goals through forms of political organization adopted from the dominant culture. Their Junta was legally constituted according to Costa Rican law during the period of the Participatory Action Research project. The Junta, therefore, can meet as political equals with the corresponding Juntas of neighboring communities; it can solicit and receive funds, open a bank account, sign legal documents, enter into contracts. It has chosen, in fact, to enter into various contracts with ANAI and with government agencies and the University of Costa Rica, as outcomes of the Participatory Action Research project. In each case -- the management of the green iguana semi-domestication experiment, the planting of scarce resource nurseries, the certification of Wildlife Inspectors, the publication of a book, and the showing of slides -- the Junta has utilized "modern" means and technologies in attempts to restore and preserve the KéköLdi universe.

There is no guarantee these strategies will work either to stop encroachment from outside the Reserve or to prevent apostatization from within. Through the Participatory

Action Research project, the Kéköldi people have secured the support of ANAI and of some governmental units in their struggle to defend the boundaries and the natural resources of their Reserve. Their ultimate success, however, will also hinge on the actions of national policy makers who are influenced by exigencies, opportunities and constraints operating in the world politico-economic system. The recent experience of the discovery of oil within the Talamanca Reserve is a cautionary tale: the same Costa Rican government which created the Talamanca Indian Reserve manipulated its own laws to facilitate oil explorations within the Reserve, "in the national interests". Such "national interests" may also override environmentalists' and Indians' objections to the proposed construction of a transcontinental oil pipeline, which could bisect both the Talamanca and the Kéköldi reserves.

Government policies regarding tourism development, squatters' rights, land titling and agricultural development will affect the non-Indian peasant populations that surround the Kéköldi Reserve and influence their attitudes and behaviors toward both the natural environment and Indian rights. Analysts of current Costa Rican economic policy conclude that "the prognosis for the Costa Rican peasant is not good. Options have evaporated, and there is no relief in sight. The next twenty years are likely to see a progressive decline in his already inadequate standard of

living" (Seligson 1980, p.168).

The dominant Hispanic cognized model of the environment and Costa Rica's dependency within the world economic system have combined to create the present crisis. The dominant Hispanic cognized model holds that humankind is apart from and has dominion over nature, that land is abundant, and that civilization progresses as "useless" forest is cut and land is "cleaned" and cultivated (Bozzoli 1986, pp.12-13). State agricultural policy in the last two decades has conformed to priorities set by international lending agencies, favoring agro-exports as a way of generating the foreign exchange needed to service the debt, which, when measured per capita, is the second highest in the world. Increasing land concentration, agro-export expansion and soil degradation have pushed peasants up to and beyond the ecological fringes; the frontier has been exhausted (Augelli 1984, p.48). By Rappaport's criteria (1979, p.140), the laws of nature have found the dominant Costa Rican cognized model of the environment, and State policies, to be maladaptive.

To preserve their natural resources and, along with them, their cultural identity, the indigenous people of the Kéköldi Reserve have to defend their lands from invasion by the peasant victims of the Costa Rican socio-environmental crisis. There is an urgent need to formulate sustainable livelihood strategies for these quite desperate people.

ANAI's regional land-titling and community-based agroforestry programs are important steps in this direction; the KéköLdi Junta's slide show and discussions in these communities may contribute toward greater environmental consciousness. But without major changes in Costa Rican economic policy and social structure, environmental and social stresses in the Talamanca region are likely to intensify. The people of the KéköLdi Reserve will have to struggle to defend their borders and preserve their universe.

As to the likelihood of apostatization from within, the KéköLdi people's resilience to date suggests that they may well be able to incorporate into their world view the epistemological, social and political adaptations they are presently undergoing. They demonstrate an ability to learn ecological principles through their own observations and through discussion with environmentalists, and incorporate these principles into their own world view. They generally find Western ecology to be supportive of, rather than challenging to, their understanding of the humankind-nature relationship. In discussions with environmentalists, KéköLdi people (young as well as old) often projected the satisfied aspect of the wise parent acknowledging that at least some white people were finally realizing things the Bribris have known all along. As long as the KéköLdi people interpret Western science as compatible with Bribri

conceptualizations, their new alliance with environmentalists operating out of the Western scientific cognized model may not lead to apostatization. Similarly, if they continue to use non-traditional political organization and technical knowledge adopted from the dominant society to increase their effectiveness in protecting and preserving their universe, these social and technical transformations may prove to be adaptive rather than apostatizing.

External challenges to the Kéköldi people's universe (their forest and wildlife and the meanings attached to these) have catalyzed a sort of holy crusade among them in which their most ancient beliefs and their most astute use of non-traditional technologies are mutually supportive. However, with the entire lowland Talamanca region currently undergoing rapid social change, the Kéköldi people will continue to face many new challenges to their world view and way of life. During the course of the Participatory Action Research project, the Task Force and Junta members engaged in soul-searching discussions of such questions as, "Should we accept the government's offer to extend electricity into the Reserve?"; "Can we have electricity and maintain our culture?"; "Should we permit tourists to come into the Reserve?"; "If we were to conduct nature walks for tourists and charge a fee, we could make money to implement other important projects, but what would Sibö think of this

arrangement of selling nature?"

Inflexible cognized models can make it difficult for tribal people to adapt to changes in their social and physical environments (Lawrence 1964, cited in Rappaport 1984, p.241). In raising the kinds of questions cited above, the people of the KéköLdi Reserve demonstrate an ability to assess critically the options available to them within the terms set by their traditional cognized model of the environment. This process of rationalization of sacred ritual could lead gradually to despiritualization and ultimately apostatization; conversely, rational perception of the beneficial adaptive functions of their cognized model and their sacred rituals could validate and strengthen the KéköLdi people's adherence to tradition.

V. CONCLUSIONS AND IMPLICATIONS OF THE STUDY

A. Epistemology Issues

It has been suggested that in the search for sustainable livelihood strategies, chances of success are increased when a "synthesis" of indigenous knowledge and Western scientific knowledge is aspired to (Howes and Chambers 1980, p.332). In reflecting on my experience working with the people of the KéköLdi Reserve, I find the term "synthesis" problematic. It suggests that both knowledge systems give way and merge into a new creation, without retaining their individual integrity. While in specific instances, new knowledge may emerge from a synthesis of indigenous and Western scientific knowledge, the two ways of knowing remain distinct. Knowledge systems or cognized models are, in any case, dynamic, not static; they evolve in response to "an everchanging world" (Rappaport 1979, p.147). In Talamanca, both indigenous and Western scientific cognized models may change, over time, partially in response to the influence of contact with the other. But neither the Bribris nor the ecologists aspire to a synthesis. A more appropriate goal is to develop a complementary relationship which recognizes the "reciprocal benefits from cooperation between the two systems of knowledge" (Richards, cited in Brokensha 1980, p.4).

Through the KéköLdi Participatory Action Research (PAR) project, it was learned that a basis exists for such a complementary relationship between the Bribri knowledge system and that of the Western ecologists; while they differ in their understandings of the processes involved, these groups define the same environmental problems and prescribe complementary measures to address them. This finding adds to the empirical evidence cited by Clay which shows most indigenous knowledge systems to be consistent with ecological principles. It also supports Rappaport's theoretical assertion that tribal peoples' "respect" for nature, expressed through sacred ritual, functions to regulate their use of natural resources in environmentally sustainable ways.

The KéköLdi study raises a new epistemological question: What happens when a tribal group becomes conscious of the positive regulatory functions served by its sacred rituals? For the people of the KéköLdi Reserve, this consciousness appears to be reenforcing and revitalizing the traditional Bribri cognized model of the environment. This finding is important, for it counters the more common observation that when indigenous and Western scientific knowledge systems meet, indigenous knowledge is usually "squeezed out", leading to loss of confidence among the indigenous people and to irreversible loss of indigenous knowledge (Howes and Chambers 1980, p.332).

As development and conservation efforts advance throughout the Third World, such "meetings" are occurring with increased frequency. Whether they result in "despiritualization" of the indigenous world view and irreversible loss of indigenous knowledge, or, conversely, in reinforcement and revitalization of indigenous knowledge systems and resource management practices, will have significant environmental as well as social consequences. In this context, the KéköLdi experience provides a useful model for achieving, through PAR, a complementary relationship whereby both indigenous and Western scientific knowledge are strengthened.

B. Political Economy Issues

An analysis of the current socio-environmental crisis in Talamanca showed that structural inequalities at all levels of social interaction, from global to local, have been critical in creating the crisis; it follows that solutions will require changes in the social structure.

During the nine-month duration of the KéköLdi PAR project, participants engaged in some discussions of political economy, although this was not the central focus of our attention. For the peaceful resolution of conflicts among the three major ethnic groups dependent on the finite resources of the Talamanca region, it will be very important

for all to gain a clearer understanding of the historical and contemporary structural inequalities that have generated the present socio-environmental crisis. Neither socially nor physically sustainable development will be possible in Talamanca if Indians view the incoming Hispanic "ecological refugees" as the enemy, or if both Blacks and Hispanics see the Indians as obsolete obstacles to development.

One of the greatest challenges in future work in the Talamanca region will be to find ways through which all three ethnic groups can analyze the evolution of their own and each others' social conditions. Although they are divided by very profound differences in race, culture, language and religion, their common experience of various kinds of oppression and their common interest in assuring the sustainability of the Talamanca environment for future generations, may enable them to see each other not as enemies but, necessarily, as allies. The Freirian model of experience-based social analysis could be an effective means of facilitating such learning. It is a process through which the people of Talamanca might become better equipped to evaluate the development options that are available to them, so that they can make decisions in the long-term interests of their communities.

The KéköLdi PAR project contributed to structural change in two ways: it contributed to the empowerment of a historically disenfranchised people, and it took a stand

against cultural imperialism. In becoming PAR, control was shifted from sympathetic outsiders to the KéköLdi people themselves. Management of a research project and ownership of its products (a book, a slide show, a green iguana domestication experiment) strengthened the KéköLdi Junta as a political body and brought the KéköLdi people into view both regionally and nationally as an active force within the Costa Rican society. The social order, in which indigenous people had been traditionally silent and invisible, was challenged by the KéköLdi people who showed themselves to be self-acting, not acted upon; researchers, not researched; managers, not recipients, of a community development project. The empowerment of the KéköLdi people has been met with resistance (e.g., Gloria Mayorga and Juanita Sánchez's names were excluded from the program of an academic conference; the Puerto Viejo community Junta was offended when the KéköLdi people insisted on acting for themselves rather than under Puerto Viejo sponsorship in a political situation; Wildlife Inspectors have been threatened). In other cases, however, it has successfully tipped the balance in social relations (e.g., the Hispanic community of San Miguel accepted the technical assistance of KéköLdi iguana project managers; police authorities have acted on all complaints filed by KéköLdi Wildlife Inspectors).

The empowerment of the KéköLdi people may also influence other Costa Rican indigenous groups. The KéköLdi

Junta sent copies of their book to the other 20 Indian Reservations in Costa Rica; they also plan to show their slide presentation to these groups. In early 1989, Juanita Sánchez became KéköLdi's first elected representative to the National Indian Council, giving her, and through her the KéköLdi people, a new forum in which to exercise their empowerment.

Cultural imperialism in Costa Rica exists in both international and national forms. Messages and images from the First World dominate the Costa Rican media; nationally produced radio and television programs and school textbooks conform to Hispanic ("white") ethnocentrism and urban bias. Against this tide, the Black and Indian populations of Talamanca have collaborated in a number of projects through which they have produced books that record their roles in and views of the region's history and development (Palmer 1983, 1986, and 1988). Some of these texts have been incorporated into the national school curriculum, as reminders of Costa Rica's cultural diversity.

The KéköLdi people are using their new book in their own school, and they have donated copies to elementary and secondary schools in the Talamanca area. Their slide show is a new weapon in Talamanca's fledgling arsenal against cultural imperialism. Much more effective use of regional and national media, especially radio, could greatly augment the impacts of these efforts.

C. Methodology Issues

While many factors may influence the relative chances for cultural survival among indigenous peoples as they experience contact with Western culture, the approach that Western scientists take in their encounters with indigenous people is certainly one such factor. The KéköLdi experience demonstrates the effectiveness of the PAR methodology as a means toward developing a complementary relationship that benefits both indigenous people and the scientific community.

Benefits to the KéköLdi people include:

1. improved enforcement of KéköLdi Reserve borders and anti-poaching laws;
2. opportunities for KéköLdi people to learn useful knowledge and skills which they can apply toward their own purposes, thereby becoming more self-reliant;
3. reaffirmation of the KéköLdi people's cultural traditions and identity;
4. strengthening of the KéköLdi people's political organization;
5. inauguration of new experimental projects (e.g., the green iguana project) which may contribute to improved livelihood conditions as well as resource conservation;
6. formation of alliances with governmental and non-governmental organizations.

The scientific community benefitted from the generation and dissemination of new ethnographic and ethnoscientific knowledge; environmental protection objectives were also advanced by gaining the active participation and collaboration of the KéköLdi people in regional natural resource management efforts. The ANAI sponsors of the original research proposal recognize that in becoming PAR, the project's accomplishments far exceeded their original expectations (letter from Bill McLarney to Cultural Survival, Inc). An environmentally pro-active, self-motivated KéköLdi population is a far better ally than a passively acquiescent one.

To assert the achievement of these beneficial outcomes raises the question of evaluation. Within the framework of PAR, criteria for and means of evaluation must be discussed and decided upon by the participants themselves. Conscious and informed self-evaluation is most common in PAR, although it is conceivable that under some circumstances a PAR group would ask or permit "outside" researchers to evaluate projects they have undertaken. As the "client", the PAR group would be in control of the evaluation process and would "own" the results, although, for purposes of validity, participants might not be involved in the preparation of evaluation instruments. Their role in establishing the criteria for evaluation is critical, however.

For example, by conventional sustainable development

criteria, the KéköLdi green iguana project could be measured in terms of its technical success or failure, acceptance of domesticated green iguana meat by the various ethnic populations of the region, decreased pressure on wild game, commercial success or failure of the venture, and its socioeconomic impacts. But the green iguana project may have meanings for or impacts on members of the KéköLdi community that would escape evaluation in these conventional terms. In the Bribri cognized model of the environment, for example, animals are separated into wild and domestic categories and different rules of reciprocity apply to each group. For the Bribris, therefore, evaluation of the domestication project would need to include impacts on the traditional Bribri "order". Their criteria might also include impacts of the traffic of national and international visitors at the iguana nursery: are these new interactions with "outsiders" perceived as beneficial or disruptive? Do the impacts of the project serve to unite or divide the KéköLdi people?, to strengthen or threaten their culture? Such questions suggest the possibility that a project which is "successful" in terms of Western indicators of sustainable development, may be "unsuccessful" according to a community's own priorities and purposes, and vice versa.

In PAR, where conscious and informed self-determination is the means as well as the goal, it is the participants' own evaluation of the research process and its

outcomes that is viewed as most important. Conscious and continual evaluation by participants of the learning-acting process in which they are engaged, should be built into PAR. As an integral aspect of the PAR process, evaluation provides an opportunity for participants to gain analytical skills, increase self-awareness and maximize the effectiveness of their actions toward achieving their own goals.

In the KéköLdi case, the evaluation process is informal and ongoing. Accumulated learning from initial experiences is integrated into the Junta's decision-making concerning next steps and alternative strategies. When I met with the KéköLdi Junta 16 months after leaving the region to pursue graduate studies, members discussed a broad range of outcomes of the strategies initiated during our PAR work together. This evaluation was largely for my benefit; the issues had clearly been discussed many times before. Junta members' observations included evidence of the increased effectiveness of enforcement of anti-poaching laws and the reappearance of previously "disappeared" species, as well as constraints on action against squatters ("They're so poor; they have nothing. We decided to let them keep the land they had already cleared, but they know we are watching them. The Inspectors make sure to let them know we are watching them.")). They also demonstrated an awareness of the human development dimensions of the PAR process; they

expressed this in a joking manner (e.g., "President Arias better look out for his job: Juanita is moving up fast!"). They were very concerned about the consequences of collective empowerment, perceiving resistance to their activism, especially among their Black neighbors, and searching for ways to mitigate the conflict without surrendering their rights or diminishing their authority over their own affairs. They examined all these issues in light of their Bribri identity, asking at every turn, "How does this affect us as Indians? What should we do and what must we avoid in order to maintain and strengthen our culture?"

To my knowledge, the Junta has made no attempt to systematize evaluation by drawing up, for example, a set of community principles or criteria whereby past experiences or new proposals may be judged. Whether such an exercise would lead to more self-awareness and more discerning decision-making than the Junta currently achieves through its intuitive process, is open to question. In PAR, criteria for and means of evaluation must emerge from the dynamics of each unique situation and each participant group. Systematizing the evaluation process, with or without the aid of outside collaborators, may serve the interests of the community by increasing self-awareness and management capabilities; it also may be necessary in order to secure or sustain outside funding for community projects. The

development of a set of principles for evaluation, corresponding to the fundamental principles of PAR, might strengthen the model. This is an area for further exploration and communication among PAR practitioners.

D. Conclusion

The self-defense of the traditions of [a tribal community] is the most efficient political action towards the preservation of its natural resources (Leff 1985, p.260).

The KéköLdi PAR experience both confirms Leff's assertion and suggests a means through which tribal people can build their self-defense capabilities.

The epistemological, politico-economic and methodological concerns that have guided this study may be summarized as follows:

- Social inequalities are at the heart of the Third World's environmental crisis.

- Achieving physically and socially sustainable development requires political action to bring about more equal social relations at all levels of human interaction.

- Western scientists who would promote sustainable development in the Third World can best do so by

facilitating and supporting indigenous peoples' autonomous efforts to preserve their traditional knowledge systems and, through them, their natural resources.

-Self-determination, a fundamental expression of social equality, must not be viewed as a distant goal but as the best practical means of working toward sustainable livelihood on the planet.

-Participatory Action Research, which facilitates self-determination and increased self-reliance, and which places indigenous and Western persons and epistemologies on equal terms, provides the most adequate framework through which Western scientists can contribute to sustainable development in the Third World.

In the Talamanca region of Costa Rica, threats to the environment (especially the remaining lowland tropical forest and the coral reefs) are a consequence of national agro-export policies that correspond to Costa Rica's dependent position in the world economic system. Development programs designed to achieve economic growth, sponsored by international lending and aid organizations and implemented by national government and private sector collaborators, have served the interests of Costa Rica's upper and middle classes; at the same time they have devastated the natural resource base and consolidated land holdings, imperiling the lives and livelihoods of a growing

population of rural poor. In Talamanca, Costa Rica's "last frontier", the society's poorest and least powerful groups -- Indians, Blacks and Hispanic "ecological refugees" -- are driven into conflicts as they reach the limits of environmental sustainability.

The socio-environmental crisis in Talamanca reflects the pattern of Third World rural impoverishment described by Galtung in his "structural theory of imperialism" (1971). When Galtung set himself the task of prescribing means to achieve a new world order characterized by "peace, economic well-being, social justice and ecological balance", he found that his prescriptions, which fill a 450-page book, could be condensed into one central concept: self-reliance (1980, p.413). In Galtung's view, self-reliance is a psychopolitical phenomenon. It is measured by a people's ability to resist cultural imperialism by acquiring and maintaining self-confidence and a strong, positive cultural identity, and by the ability to resist economic and political domination by relying increasingly on themselves and their closest neighbors to meet their material needs and articulate their political will.

In Talamanca, achieving greater self-reliance in Galtung's terms requires strengthening the self-confidence and cultural integrity of each ethnic group while, at the same time, building collaborative regional economic and political relations through which the people of Talamanca

can together resist the political and economic forms of domination that have created their present socio-environmental crisis. Future work in Talamanca should be guided by the imperative to promote increased self-reliance through both these means.

BIBLIOGRAPHY

BIBLIOGRAPHY

- Augelli, John P. 1984. "Costa Rica: Transition to Land Hunger and Political Instability." Pp. 48-61 in 1984 Yearbook, Conference of Latin American Geographers, edited by Katherine M. Kvale.
- Bahro, R. 1982. Socialism and Survival. London: Heretic Books.
- Barahona Riera, Francisco. 1980. Reforma Agraria y Poder Político. San José: Editorial Universidad de Costa Rica.
- Bozzoli de Wille, Maria Eugenia. 1976. "La Frontera Agrícola de Costa Rica y su Relación con el Problema Agrario en Zonas Indígenas." Unpublished paper.
- _____. 1979. El Nacimiento y la Muerte entre los Bribri. San José: Editorial Universidad de Costa Rica.
- _____. 1986. "Contrasting Views of Nature: The Way Two Costa Rican Cultures Have Dealt With The Forest." Paper presented to the Third International Conference of the International Society for Comparative Psychology, San José, Costa Rica, July 24-28.
- _____. 1988. "The Ideology of Reciprocity as Reflected in Man-Animal Relationships Among the Bribri Indians and National Costa Rican Ideologies on Natural Resources." Paper presented to the Twelfth International Congress of Anthropological and Ethnological Sciences, Zagreb, Yugoslavia, July 24-31.
- Brandt Commission. 1980. North-South: A Programme for Survival. London: Pan Books.
- Brokensha, David, D.M. Warren, and Oswald Werner. 1980. Indigenous Knowledge Systems and Development. Lanham, MD: University Press of America, Inc.

- Brown, L. David and Rajesh Tandon. 1983. "Ideology and Political Economy in Inquiry: Action Research and Participatory Research." The Journal of Applied Behavioral Science 19(3):277-94.
- Bunker, Stephen G. 1984. "Modes of Extraction, Unequal Exchange, and the Progressive Underdevelopment of an Extreme Periphery: The Brazilian Amazon, 1600-1980." American Journal of Sociology 89(5):1017-64.
- Carneiro, R.L. 1961. "Slash and Burn Cultivation Among the Kuikuru and Its Implications for Cultural Development in the Amazon Basin." Pp. 47-67 in The Evolution of Horticultural Systems in Native South America: Causes and Consequences, A Symposium. Caracas: Antropologica Supplement No. 2.
- Chambers, Robert. 1979. "Editorial." IDS Bulletin 10(2):1-3.
- _____. 1983. Rural Development: Putting the Last First. Essex: Longman Group Ltd.
- Charmaz, Kathy. 1983. "The Grounded Theory Method: An Explication and Interpretation." Pp. 109-26 in Contemporary Field Research: A Collection of Readings, edited by Robert M. Emerson. Boston: Little, Brown and Company.
- Clay, Jason. 1987. Indigenous Peoples and Tropical Forests: Models of Land Use and Management from Latin America. Cambridge, MA: Cultural Survival, Inc.
- Davis, Shelton H. 1977. Victims of the Miracle: Development and the Indians of Brazil. Cambridge: Cambridge University Press.
- Devall, Bill. 1980. "The Deep Ecology Movement." Natural Resources Journal 20(2):299-322.
- Dirección General de Estadística y Censos. 1973. Censo de Población de Costa Rica. San Jose.
- Dirección General de Estadística y Censo. 1984. Censo de Población de Costa Rica. San Jose.
- Eckholm, Eric P. 1976. Losing Ground: Environmental Stress and World Food Prospects. New York: W.W. Norton and Co., Inc.

Fals Borda, Orlando. 1985. Conocimiento y Poder Popular: Lecciones con Campesinos de Nicaragua, Mexico y Colombia. Mexico: Siglo Veintiuno Editores.

_____. 1987. "The Theory and Practice of Participatory Action Research: Issues from Fieldwork in Three Latin American Countries." EADI Bulletin 1:41-47.

Fernández Arias, Mario E. 1976. La Población de Costa Rica. San José: Universidad de Costa Rica, Instituto de Investigaciones Sociales.

Fleming, Donald. 1972. "Roots of the New Conservation Movement." Perspectives in American History 4:7-91.

Foley, Michael W. 1977. "Who Cut Down the Sacred Tree?" Coevolution Quarterly Fall:60-67.

Freire, Paulo. 1970. Pedagogy of the Oppressed. New York: Herder & Herder.

Galtung, Johan. 1971. "A Structural Theory of Imperialism." Journal of Peace Research 2:81-115.

_____. 1973. "'The Limits to Growth' and Class Politics." Journal of Peace Research 10(1-2):101-14.

_____. 1980. The True Worlds: A Transnational Perspective. New York: The Free Press.

Gaventa, John. 1985. "The Powerful, the Powerless and the Experts: Knowledge Struggles in an Information Age." Unpublished paper.

Guess, G.M. 1977. "The Politics of Agricultural Land Use and Development Contradictions: The Case of Forestry in Costa Rica." Ph.D. diss. Riverside: University of California.

Hall, B.L. 1981. "Participatory Research, Popular Knowledge and Power: A Personal Reflection." Convergence 14(3):6-17.

Hartshorne, Gary et al. 1982. Costa Rica: Country Environmental Profile. A Field Study. San José: Tropical Science Center.

Howes, Michael and Robert Chambers. 1980. "Indigenous Technical Knowledge: Analysis, Implications, and Issues." Pp. 329-40 in Indigenous Knowledge Systems and Development, edited by David W. Brokensha, D.M. Warren and Oswald Werner. Lanham MD: University Press of America.

- Jones, Lisa. 1989. "Erosion Claiming Tons of C.R. Soil, Experts Say." The Tico Times. March 17:10.
- Klee, Gary A. 1985. "Traditional Marine Resource Management in the Pacific." Pp.193-202 in Culture and Conservation: The Human Dimension in Environmental Planning, edited by J. McNeely and D. Pitt. London: Croom Helm.
- Leff, Enrique. 1985. "Ethnobotanics and Anthropology as Tools for a Cultural Conservation Strategy." Pp. 259-268 in Culture and Conservation: The Human Dimension in Environmental Planning, edited by J. McNeely and D. Pitt. London: Croom Helm.
- Leonard, H. Jeffrey. 1987. Natural Resources and Economic Development in Central America. New Brunswick: Transaction Books.
- Martin, Calvin. 1978. Keepers of the Game: Indian-Animal Relationships and the Fur Trade. Berkley: University of California Press.
- Mayorga, Gloria, Paula Palmer and Juanita Sánchez. 1988. Cuidando los Regalos de Dios: Testimonios de la Reserva Indígena de Cocles/Kéköldi. San Jose: Departamento de Publicaciones, Universidad de Costa Rica.
- McNeely, Jeffrey A. and David Pitt (eds.) 1985. Culture and Conservation: The Human Dimension in Environmental Planning. London: Croom Helm.
- Meehan, Peter M. and Michael B. Whiteford. 1985. "Expansion of Comercial Cattle Production and its Effects on Stratification and Migration: A Costa Rican Case." Pp.178-95 in Social Impact Analysis and Development Planning in the Third World, edited by William Derman and Scott Whiteford. Boulder: Westview Press.
- Nations, J.D. and D.I. Komer. 1984. "Indians, Immigrants and Beef Exports; Deforestation in Central America." Cultural Survival Quarterly 6(2):8-12.
- Norgaard, Richard B. 1981. "Sociosystem and Ecosystem Coevolution in the Amazon." Journal of Environmental Economics and Management 8:238-54.
- Palmer, Paula (ed.). 1983. Nuestra Talamanca Ayer y Hoy. San José: Ministerio de Educación Pública.

Palmer, Paula. 1986. "Wa'apin man": La historia de la costa talamanca de Costa Rica, según sus protagonistas. San José: Ministerio de Cultura, Juventud y Deportes, Instituto del Libro.

_____. 1988. "Self-History and Self-Identity in Talamanca, Costa Rica." Pp. 185-95 in Direct to the Poor: Grassroots Development in Latin America, edited by Sheldon Annis and Peter Hakim. Boulder: Lynne Rienner Publishers.

Pitt, David. 1985. "Towards Ethnoconservation." Pp. 283-96 in Culture and Conservation: The Human Dimension in Environmental Planning, edited by Jeffrey A. McNeely and David Pitt. London: Croom Helm.

Posey, D.A. et al. 1984. "Ethnoecology as Applied Anthropology in Amazonian Development." Human Organization 43(2):95-107.

Rappaport, Roy. A. 1971. "The Sacred in Human Evolution." Annual Review of Ecology and Systematics 2:25-44.

_____. 1974. "Sanctity and Adaptation." Coevolution Quarterly Summer:54-68.

_____. 1979. Ecology, Meaning and Religion. Berkley: North Atlantic Books.

_____. 1984. Pigs for the Ancestors. New Haven: Yale University Press.

Redclift, Michael. 1984. Development and the Environmental Crisis: Red or Green Alternatives? London: Methuen.

_____. 1987. Sustainable Development: Exploring the Contradictions. London: Methuen.

Sahlins, Marshall D. 1968. Tribesmen. Englewood Cliffs, New Jersey: Prentice Hall, Inc.

Seligson, Mitchell A. 1980. Peasants of Costa Rica and the Development of Agrarian Capitalism. Madison: University of Wisconsin Press.

Swantz, Marja Liisa and Arja Vainio-Mattila. 1988. "Participatory Inquiry as an Instrument of Grass-roots Development." Pp. 125-43 in Human Inquiry in Action: Developments in New Paradigm Research, edited by Peter Reason. London: Sage Publications.

Tandon, Rajesh. 1982. "A Critique of Monopolistic Research." Pp. 79-84 in Creating Knowledge: A Monopoly, edited by Budd Hall, Arthur Gillette and Rajesh Tandon. New Delhi: Society for Participatory Research, and Toronto: International Council for Adult Education.

Wallace, Anthony F.C. 1956. "Revitalization Movements." American Anthropologist 58(2): 264-81.

Warren, Dennis M. 1980. "Ethnoscience in Rural Development." Pp. 369-82 in Indigenous Knowledge Systems and Development, edited by David W. Brokensha, D.M. Warren and Oswald Werner. Lanham MD: University Press of America.

White, Lynn, Jr. 1968. Dynamo and Virgin Reconsidered: Essays in the Dynamism of Western Culture. Cambridge MA: Massachusetts Institute of Technology Press.

World Conservation Strategy. 1980. Living Resource Conservation for Sustainable Development. Grand, Switzerland: International Union for Conservation of Nature and Natural Resources.

MICHIGAN STATE UNIV. LIBRARIES



31293006097384