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**“Contemporary Approaches to Natural Resource Management:
Collaborative Management and Reforestation Activities in the
Municipality of El Castillo, Rio San Juan, Nicaragua”**

by

Gioconda Ortega-Alarie B.Sc.

**Thesis submitted to the Faculty of Graduate Studies and Research
in partial fulfilment of the requirements for the degree of**

Master of Arts

Department of Geography and Environmental Studies

**Carleton University
Ottawa, Ontario
May 2001**

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“Contemporary Approaches to Natural Resource Management:
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Gioconda Ortega-Alarie, B.Sc.
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the degree of Master of Arts

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May, 2001

ABSTRACT

In the Municipality of El Castillo in Nicaragua, the burden of economic development and political instability have often been borne by the environment and the rural poor. Contemporary discourses in natural resource management have brought to light reasons for the failure of conventional approaches to rural development and argue that the nurturing of a more integrated approach, where society-environment-politics are considered equally important, would be more productive. Collaborative management approaches fall into this category, where problems over natural resource use and management are negotiated between the two key actors – the state and local communities. Considering the importance of reforestation activities for the sustainability of natural resources and local livelihoods in El Castillo, co-management approaches to reforestation were suggested as a feasible alternative. The research findings indicate a history of less than successful programs implemented by the government and outside organisations. In many instances these shortcomings can be traced to failing to involve the community in a more participatory way. A key finding of this research is that community forestry cannot be fully decoupled from broader issues of development and poverty alleviation in El Castillo. This in turn suggests there is a need to rethink the positioning of community forestry. That is community forestry is perhaps better thought as an important contributory to development but by itself it is unreasonable to expect community forestry to be the primary catalyst of development.

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TABLE OF CONTENTS

	Page
Acceptance Page	ii
Abstract	iii
Acknowledgements	iv
Table of Content	v
List of Figures	viii
List of Tables	ix
List of Maps	x
Annexes.....	xi
Acronyms.....	xii
 Chapter 1 Introduction	 1
1.1. Contemporary Views of Natural Resources Management	1
1.2. Community Forestry in Nicaragua: A Microcosm of	5
Development	
1.3 Thesis Purpose and Objectives	7
1.4 Overview of the Thesis	8
 Chapter 2 Community Reforestation an Opportunity for	 10
Collaborative Management	
2.1 Reforestation as a Response to Forest Resource Degradation	10
2.2 Co-Management in Reforestation Activities - A New Dimension	15
2.2.1 Concepts and origins of co-management	15
2.2.2 Co-management as a process	17
2.2.3 Co-management as an effective approach in the	18
management of natural resources	
2.2.4 Common grounds in reforestation activities for	31
the application of co-management arrangements.	

	Page
Chapter 3 Community Participation in Natural Resource	34
Management: A Case Study in Southern Nicaragua	
3.1 Area of Study	34
3.1.1 Geography	35
3.1.2 History	41
3.1.3 Socio-Economic Context	45
3.2 Context in which Reforestation is being Taken	46
3.2.1. Phase I of reforestation - Selection and implementation of the project	46
3.2.2. Other reforestation programs	49
3.2.3 Tools to Understand the Role of Reforestation in Community Development	49
3.3.1 Methods Used	49
3.3.2 Description of field work	54
3.4 Analytical Procedures	58
3.4.1 Organisation of the data	59
3.4.2 Content Analysis	60
 Chapter 4 Results and Discussions	 68
4.1 Co-Management as an Alternative in the Management of Local Natural Resources	68
4.1.1 The politics of natural resources management in 'El Castillo'	68
4.1.2 Land tenure issues	69
4.1.3 Who are the Stakeholders?	73
4.2 Conflict and Development	88
4.2.1 What constitutes conflict in this study?	88
4.2.2 Sources of conflict	90
4.3 The Reforestation Project	102
4.3.1 Community Profiles	102

	Page
4.3.2 Active community participation or receptive communities over project implementation?	105
4.3.3 Choice of Species - Who decides in the end?	107
4.3.4 Social Equity and Participation in Reforestation Activities	109
4.3.5 Barriers Encountered	111
4.3.6 Perceived Impacts of Reforestation Activities at the Local Level	113
 Chapter 5 Conclusions	 116
 Annex 1	 121
Annex 2	122
Annex 3	124
Annex 4	125
 References	 126

LIST OF FIGURES

	Page
Figure 1	
Arnestein’s eight rungs of the ladder of participation	21
Figure 2:	
Berkes’s Spectrum of Co-Management Arrangements	27
Figure 3	
Methodological framework used	51

LIST OF TABLES

	Page
Table 1 Interview indexing grid	62
Table 2 Matrix by objective	63
Table 3 Key actors identification map	64
Table 4 Conflict matrix	66
Table 5 Data comparison on farm's ownership	71
Table 6 Land use tax rates	72
Table 7 Ranking of conflict sources	92
Table 8 Types of conflicts and sources identified in the field	100
Table 9 Tree species most frequently used in reforestation activities	108

LIST OF MAPS

	Page
Map 1 Area of study	34
Map 2 Classification of the development zones	38

ANNEXES

	Page
Annex 1: Location of Communities Visited in the Municipality of El Castillo	122
Annex 2: Questionnaire Used in Open-Ended Interviews	123
Annex 3: Specific Questions Used with Focus Groups	125
Annex 4: Scientific Names of Species Used in Reforestation	126

LIST OF ACRONYMS

AMUNIC	Asociación de Municipios del Castillo
CGEA	Centro para la Gestión y Estudios Ambientales
CIPRES	Centro de Investigación y Promoción del Desarrollo Rural
COREXSA	Corfop Extracciones S.A.
CTFSN	Comisión Técnica Forestal del Sureste de Nicaragua
DANIDA	Danish Development Agency
EC	European Community
FAO	United Nations Food and Agriculture Organisation
FdR	Fundación del Río
GEF	Global Environmental Facility
GME	Güises Montaña Experimental
GoN	Government of Nicaragua
GRSO	Grassroots Support Organisations
IFI	International Funding Institutions
INIFOM	Instituto Nicaragüense de Fomento Muanicipal
INRA	Instituto Nicaragüense de Reforma Agraria
IRENA	Instituto Nicaragüense de Recursos Naturales y el Ambiente
JFM	Joint Forest Management
MAG	Ministerio de Agricultura y Ganadería
MARENA	Ministerio de Recursos Naturales y el Ambiente
MINSAL	Ministerio de Salud
NGOs	Non Governmental Organisations
OEAS	Organización de Estados Americanos
PNUMA	Programa de las Naciones Unidas par el Medio Ambiente
SI-A-PAZ	Sistema Nacional de Areas Protegidas para la Paz
SI-FEC	Solidaridad Internacional-Fundación Española para la Cooperación
TWI	Third World Initiative
UCOPA	Union de Cooperativas de la Palma Africana
UNO	Unión Nacional Opositora
UNDP	United Nations Development Program

CHAPTER ONE - INTRODUCTION

1.1. Contemporary Views of Natural Resources Management

Economic development has often been founded upon development and exploitation of natural resources. Development, as accurately framed by Redclift (1984:2-4), “is about the creation of economic (often market) ‘value’ as natural resources are transformed into ‘goods’, into commodities”. Rich countries, local government and elite from developing countries have seen the exploitation of natural resources as the panacea to acquire wealth, power and status (Omara-Ojunga; 1991; Goodman & Redclift, 1991; Ascher 2000). Despite increasing interest in natural resource conservation and ecologically sustainable practices, “structural and social inequity, both within and between nations” (Kothari; 1996:154) are still based on the extraction of natural resources. The control exerted over the resources and benefits received continue to favour few individuals and marginalise others.

The accumulation of wealth through the exploitation of natural resources is a symbiotic process, where first world nations impose a set of rules and conditions for their economic and political hegemony and control. These conditions are usually accepted by governments and social elites from developing nations, in order to gain political and economic control for their own benefit. The economic control executed by powerful nations is done through:

- (i) The involvement of national and transnational corporations in the direct extraction of resources (logging, mining, etc.);

- (ii) The implementation of economic sanctions due to political conflicts. Examples of these are the economic embargo placed by the United States over Cuba and Nicaragua from the eighties to the nineties; and
- (iii) The sponsorship of 'development' programs (green revolution, state development policies, etc.) through global economic policies imposed by first world nations. Such programs are usually carried out with the financial and technical support of multilateral institutions such as World Bank, Inter American Development Bank and USAID (Redclift, 1984; Bryant & Bailey, 1997).

Trends on socio-economic and environmental development programs in developing countries indicate that in a majority of cases the control of development processes are usually driven to "meet the interest of the economically and politically powerful" (Fisher, 1995:16). The different views which have been materialised in the various ecological, ethnological, economic and technological approaches used in the development and implementation of these programs have been rather erratic in tackling the economic and social issues associated with poverty (Omara-Ojunga, 1992; Connolly & Keohane, 1996).

A contributing factor to failures in socio-economic and environmental development programs is the deep-rooted belief that development should be fundamentally informed by science. Many development agencies employ a rationalistic methodology, usually developed by scholars and economists from first world nations, which are later implemented in third world countries by highly educated individuals (Redclift, 1984; McCay & Jentof, 1996). For instance, in the case of environmental development programs, Bryant and Bailey (1997:36) argue that they mostly "adopt a

technical problem-solving approach relying heavily on the input of the first world science and expertise". Moreover, their solution to the problem is rather generic based on "standard assessment of the problem" completely ignoring the knowledge of locals and as well as the political and economic context in which their activities are taking place.

Chambers (1983), Redclift (1984) and others have argued that both development and modern science have despised and ignored local knowledge. To Chambers (1983:75), "Rural people's knowledge and modern scientific knowledge are complementary. Combined they may achieve what neither would alone". The utilisation of top-down principles by sponsoring nations, aid and implementing agencies decide which problems will be defined, and what solution aid programs will pursue. "Often nobody asked the local people what they wanted" (Redclift; 1984:93) and examples of this include land reform programs based on the replenishing of depleted forest resources, and the creation of protected area programs at the expense of poor grassroots who rely on natural resources for their survival. Other issues confounding development in the industrialising world relate to governance, political instability, corruption and bureaucracy. For example, in Latin America, government officials profit from selling the country's resources to corporations from wealthier nations, who usually initiate and carry out the deal without any concern for the country's environment (Connolly & Keohane, 1996; Ascher; 2000).

Regardless of the situation poorer nations often end up subsidising the wealthier ones, and satisfying the need for capital accumulation by a social elite that have become accustomed to the consumption habits of developed nations (Redclift & Sage, 1994; Freudenburg & Gramling, 1998). The price paid for the failure of socio-economic and

environmental programs is borne by the environment, and the most marginalised groups.

The greatest pressure and impacts are on rural communities that live closer to the resources and rely on them for their subsistence. These communities are left with decreasing access to the resources, leading them to encroach deeper into the forest.

Vague property rights¹ and weakened social and cultural structures caused by dwindling natural resource bases, forces them to either move to the cities or to adopt expensive imported technologies through credits required for purchasing fertilisers and pesticides.

Contrary to what governments, conservative economists and aid agencies think, in most cases the extraction of natural resources in third world countries increases poverty among the rural poor (Goodman & Redclift, 1991; Taylor, 1998; Freudenburg & Gramling, 1998; Ascher, 2000)

Recognised shortcomings and failures of conventional approaches to development have prompted a number of developing countries to try different integrated approaches to the management of natural resources.

“Integrated rural development, farming systems research and development, sustainable agriculture, and now criteria indicators for sustainable forest management have each been heralded as a saviour of one kind or another” (Pierce et al.; 1999:41).

Collaborative management also referred to as co-management represents one alternative based on collaborative approaches to management and is based on bottom-up principles. Pinkerton, as reported in Memon & Selsky (1998:588), defines co-

¹ “Natural resource sites tend to be geographically and economically marginal areas that have become the refuge for similar marginal groups. In these areas, property or user rights tend to be poorly defined or to have passed into state control” (Ascher, 2000:14).

management as “a process of shared decision making between decision-makers and residents stakeholders who learn to optimise their mutual good and plan cooperatively with long-term horizons”. The ultimate goal of this approach is to ensure greater participation of local areas in the development process, and to ensure that development is consistent with local norms and that a fair share of benefits remains with local users in the area. By bringing together the state and local communities, this relatively new approach (to some authors in the field of forestry; Fisher, 1995) and not so new for some authors in the field of fisheries (McCay & Jentof; 1996) represents an exciting new alternative in the management of natural resources.

1.2 Community Forestry in Nicaragua: A Microcosm of Development

For decades Nicaragua, like most Central American countries, has been under the political and “economic hegemony” of the US (Redclift; 1984). From colonial times to date, the history of Nicaragua is marked by a series of historical events sharpening the gap between rich and poor and between rural and urban communities. These historical events include: internal wars, continued political and economic interventions, joint exploitation of natural resources by private and government agencies, and lastly the implementation of political and development programs that have depleted the country’s natural resources. This situation has forced rural communities into economic development processes that have further impoverished them. In the early 1970s, during the Somoza regime, the agro-economic development model, albeit rarely practised, took the form of community development. The purpose was “to correct the deficient and inconvenient structures that hinder development, diversify production, consolidate the small-scale producer’s root to

the land, and enjoyment of tranquillity and stability” (Vernooy; 1992). Overall, Somoza’s government did not lead to greater community development and control, but rather it continued the concentration of power and money in the hands of local elites and foreign groups.

In 1979, Somoza was overthrown during the Sandinista Revolution, whose political cause was based on socialist principles. In the early 1980s, Nicaragua was forced by the Reagan and Bush governments to a “virtual war economy” (Fitzgerald; 1985), which led to the destruction of infrastructure. Protected areas on the Honduran and Costa Rican borders were established in an effort to evacuate communities living in war zones. In 1989, the Sandinista government lost the elections to the opposition party led by Violeta Chamorro. Before handing power over to Chamorro, some government officials allocated national assets, including natural resources, to themselves and their relatives. One of Chamorro’s many challenges was to implement a peace process that involved the return of land expropriated by the Sandinista government to landholders under the Somoza regime, and to allocate land to displaced communities and *combatientes* (fighters) from both the Sandinistas and contra-revolutionary groups.

This research project is set within the socio-political context of *Municipio del Castillo*, where co-management approaches could be an alternative to conventional forest resource management policies and practices and lead to improvements in environment quality and socio-economic benefit for the main users (local grassroots and the state). El Castillo is located in the *Departamento de Rio San Juan* (San Juan River Department) along the south border near Costa Rica. In el Castillo the socio-political context and resources management are ultimately intertwined and cannot be isolated. Deforestation in

this Municipality has been precipitated by a series of economic, political and demographic events with several implications that have led to an overall decline in environmental quality and the quality of life within the region. The reforestation activities and land improvements efforts that have taken place suggest that these concerns are being addressed in part, but several questions about how local communities perceive and respond to reforestation projects remain. Some of these relate to:

- (i) Decisions regarding the selection and implementation of reforestation programs;
- (ii) Social equity and participation in the program; and
- (iii) Perceived economic and environmental impact of reforestation activities at the individual and household level.

1.3 Thesis Purpose and Objectives

The overall purpose of this thesis is to examine the role of co-management in development generally and specifically in regions that have a legacy of social, economic and political instability.

The specific objectives of the thesis are to examine the following issues in the delivery of a community forestry project in the *Municipio del Castillo* in Nicaragua.

- Improvement of rural livelihoods in the region;
- Fostering local control in the development of local forest resources;
- Changes in the local rural economy;
- Impacts on gender relations; and
- Benefits to the environment.

To accomplish these objectives, the following research questions were posed:

1. How does the social dimension of community affect the reforestation process? Were there reforestation activities chosen by the community? How were they carried out? Whose criteria were used in the choice of species? What were the barriers?
2. How does land tenure/access influence the decisions that are made concerning reforestation activities?
3. Based on the community experience and perceptions, what is the expected short and medium/long term effects/outcomes of the project in their livelihood?
4. Were there social equity considerations (gender, age)? Were the activities based on gender differentiation?
5. What is the impact of reforestation on the environment?

The case study will be used as a vehicle to help understand relationships between environment and society in this particular location and socio-political context, and lead to a stronger base for developing and implementing co-management strategy for forestry resources, with emphasis in reforestation activities.

1.4 Overview of the Thesis

The second chapter will develop further contemporary views on resources management, specifically related to co-management approaches and their relationship to reforestation as a means to natural resource management. The third chapter will present a case study in Southern Nicaragua, where reforestation activities have been implemented by local NGOs with the participation of local communities. This chapter will end with a presentation of methodologies and tools used in the field and data analysis procedures. The fourth

chapter will present the results of the fieldwork, which investigated grassroots' perception on project development and implementation. Discussion of the success and/or failure of reforestation projects as a natural resource management attempt will follow, as well as reasons for success and failure, and possible alternatives to avoid future failures. The fifth chapter will summarise the research activity as well as establish a foundation for assessing existing co-management programs and design alternatives for the future.

CHAPTER TWO - COMMUNITY REFORESTATION AN OPPORTUNITY FOR COLLABORATIVE MANAGEMENT

2.1 Reforestation as a Response to Forest Resource Degradation

Since ancient times, forests have been one of the most needed and exploited resources on earth (and have been critical) in providing food and shelter and transportation. In this context, “Forest and their tree vegetation are an endowment of nature to humanity, prodigiously providing towards the well being of all terrestrial life” (Tewary; 1992:268). However, the evolution of Neo-classical economic approaches to development are geared towards the accumulation of capital by powerful actors and have resulted in over-use and in some cases depletion of this resource. Post-colonial political and administrative changes have reinforced the ability of the state to control the human and natural resources within their jurisdiction, continuing the colonial legacy of “integration in a global capitalist economy, natural resources dependency, environmental degradation and political control” (Bryant & Bailey; 1997:8) in third world countries. Kothari (1996:155) points out the limitation of conventional economic development and “the current strategies for achieving economic growth significantly depend on the extraction and utilisation of natural resources far in excess of their capacities of natural regeneration”.

Deforestation is known as the process of tree removal from forested land causing the destruction of the closed nutrient cycles and physical deterioration of exposed soils (Lamprecht; 1989). It is widely known that deforestation is caused by direct human activity, such as timber harvesting, cattle ranching activities, continued clearing of land

for crop production and fuelwood gathering (Postel; 1989). Driven by a complex set of economic and political reasons the burden of 'human activities' over resource depletion has been laid on the most economically disadvantaged groups, such as indigenous and rural communities, whose subsistence depends on the utilisation of this resource.

Bryant and Bailey's (1997:27-39) work in political ecology stresses the importance of understanding the political and economic context in which environmental problems are created. The negative impact caused at the grassroots level on environmental resources- they argue- is a response to the political and economic vulnerability of rural people to state policies and accumulation of wealth by powerful individuals. Typical examples are third world countries like Brazil, with large tropical forested areas, where timber logging and cattle ranching activities account for the most damaging causes in deforestation (Lamprecht, 1989; Whitmore, 1990; Park, 1992; Fisher, 1995). Both activities require an accumulation of capital and equipment which are more likely to be in the hands of wealthier individuals and hence the responsibility for deforestation can often be traced back to primary economic drivers underpinning the timber and cattle industry (Goldsmith, 1987; Nsiah-Gyabaah, 1994; Fisher, 1995).

In most cases these activities have been introduced through the implementation of development programs which impose a new set of economic conditions at the local level. These economic conditions give place to socio-economic inequalities creating conflict over use and access to the resource among different actors. A well-documented example is the introduction of the agro-export model in Latin America, where large sections of forested areas were converted into agricultural use. The conversion of land use forced the groups that once relied on swidden agricultural practices to become either dependent

on wages and alien technologies or to further encroach on the forest. These changes resulted in their lost of rights to the use of common resources and enshrined their impoverishment (Redclift, 1984; FAO, 1985; Kok Peng, 1987; Shiva, 1987; Postel, 1988; Repetto, 1988; Goodmand & Redclift, 1991; Bryant & Bailey, 1997).

Reforestation programs have been among the many development programs funded by aid agencies that have taken place in most third world countries. Whilst reforestation activities are seen as an alternative to restore forest losses or damaged forest (Park 1992), this objective has not been achieved on a routine basis. Reasons for reforestation programmes failures vary widely, from location to location, however the following four generalised reasons capture most cases.

Economic development

Economic development does not necessarily address deforestation but aims to provide a set of economic conditions that will stimulate market development. For example, tax credits were employed in a 1980 reforestation scheme in Costa Rica and increased timber yields for logging companies (Ascher, 2000).

Conservation programs

The objective of conservation programs is to increase tree land cover. These programs have however been implemented without taking into consideration local or indigenous land practices. An example is the government reforestation program among the Karen people of the highlands in Thailand, where areas devoted to indigenous agricultural practices have been reduced by reforestation projects (FAO; 1985).

Protection of other resources

Reforestation a main objective of protection of other resources including soil and water have not been successful because they do not explicitly address prevailing socio-politic-economic conditions which caused resource degradation in the first place. The activities under this approach are usually carried out by government institutions and encourage the rehabilitation and management of degraded watersheds in isolation (Hamilton & King 1983).

Community involvement²

The main objective of this approach is to ensure community participation, through agroforestry and social forestry projects (ibid.) Though this approach could be categorised as a success (D'Silva & Appanah; 1993) from a sociological point of view, it is still reductionist in its approach, failing to take into account the ecology of the area. For example, social forestry programs in India have promoted the extensive use of fast growing species such as eucalyptus, which in turn has resulted in lowering of the water table, the depletion of soil nutrients and ecological degradation (Idris, 1986; Gupta 1989; Nsiah-Gyabaah, 1994).

In all four cases, reforestation programs have focused on selected aspects of the forest and its management, and have therefore failed to develop a more integrated approach to manage this vital resource. In most cases they have ignored the society-

² "Community involvement often has been seen as a means to widening the range and distribution of tree growing benefits by bringing public and community land into productive use and by involving landless people and the poor" (FAO; 1985:41)

environment relationship, and have lacked understanding about “nature’s economy of sustainable production through the maintenance of essential ecological processes” (Shiva; 1987:45). An example is the introduction of fast growing species in tropical forest areas, which are more likely to have a negative impact on the entire ecosystem, such as loss of biodiversity, reduced chances of wildlife survival and less favourable conditions for sustained livelihood of human communities reliant on the forest resources. Likewise, the utilisation of top-down approaches by governments and selected aid funding agencies has failed to incorporate the knowledge of users in the design and implementation of reforestation projects (Chambers, 1983; Caufield, 1986; Shiva, 1987).

Reforestation activities are a dynamic socio-cultural process. This dynamism partly evolves around conflicts resulting from individual interactions with each other and their surrounding environment. The role-played by conflict in social development projects calls for an approach that considers past failure and its sources as a base for improvement and eventual success. Such approach could offer a tangible solution to deforestation and socio-economic relations among different actors and their physical environment. Through the application of a more integrated and flexible approach, such as co-management, there is a potential not only to mitigate depletion of resources and human poverty but also to build instrumental capacity. Which involves developing leadership skills, problem solving capabilities and active community participation and thereby provide a foundation for improving community livelihood (Maton; 2000).

2.2 Co-Management in Reforestation Activities - A New Dimension

2.2.1 Concepts and origins of co-management

Co-management approaches have been used in the management of “common property resources”, including fisheries, wildlife, surface and ground water, range and forest (Feeny et al., 1990; Pinkerton, 1993). The term is also referred to as collaborative management, participatory management, shared-management, joint management, multi stakeholder management or round-table agreement (Borrini-Feyerabend, 1996; Wollenberg, 1998). With the increased recognition of the validity of local resource-user knowledge the previous existence of various forms of participatory management has been recently acknowledge and documented (Chambers, 1983; Feeny et al.; 1990).

What are the attributes of co-management?

The use of co-management principles dates as far back as 1890 with the introduction of the Lofoten Act in Norway. Through vertical decentralisation measures, in this particular case devolution³, the Norwegian government formally gave the responsibility for regulation of the fishery to the fishers” (Pomeroy & Berkes; 1997:474). Other examples that have been documented are the cooperative-based coastal fisheries in Japan established in the 1900s (Feeny et al. 1990; McCay & Jentoft, 1996; Borrini-Feyerabend, 1996; Jentoft et al, 1998), the Spanish “Confradias de Pescadores” and the French “Prud’Homie” from medieval times (McCay & Jentoft; 1996). Other relatively,

³ Devolution is the transfer of power and responsibility by legislation from the national to the local governments without reference back to the central government (Pomeroy & Berkes; 1997:471).

more recent examples from the 1940s and 1970s are the community and joint forest management in Nepal and India respectively (Fisher; 1995).

There are numerous definitions of co-management, which have been adapted to the context and the resource under discussion. The fact that the argument has been often made around the management of marine resources does not affect its validity in the context of other common property resources (ibid.) For instance, in all co-management cases reviewed there were identified three mandatory conditions in their implementation:

- (i) Dissatisfaction with a present system or conflict over a resource (McCay & Jentoft; 1996);
- (ii) A strong community organisation; and
- (iii) Co-operation between local people and state authorities (Pinkerton, 1993; Fisher, 1995; Sen & Raakjaer, 1996; Taylor, 1998).

That being said, I find Pinkerton's (1993:37) definition of co-management conclusive:

“Co-management usually develops around common pool⁴ or common property resources such as fisheries or forests because these are vulnerable to over-exploitation by private individuals, by large corporations, and by state agencies under the influence of either of the former. Co-management arrangements in general involve genuine power sharing between community-based managers and government agencies, so that each can check the potential excess of the other. Communities, which are able to play a role in management, have in many cases developed ways to prevent over-exploitation of local resources through using formal and informal mechanisms to regulate the activities of insiders and the access of outsiders. Such community-based arrangements have shown promise in improving management of fisheries, forests, wildlife, water, and other common pool resources in an ecologically and hence economically sustainable direction.”

⁴ “A common pool resource can be understood as a natural (or in some cases man-made) resources sufficiently large that it is too costly to exclude users from obtaining subtractable resource units” (Hønneland; 1999:403).

The hope in co-management approaches is that they “can benefit from the capacities and knowledge of local communities and from the resources and power of the state” (Taylor; 1998:252) to address resources degradation for the improvement of communities’ livelihood. Successful examples of community-based management such as the ‘Joint Forest Management Programme in South Gujarat, India reinforces Pinkerton’s assessment about how ecologically sustainable practices can improve the economy of communities over the use of the commons. In 1986 the Indian government introduced joint forest management approaches as an effort to solve the twin problems of weak community organisation and environmental degradation among forest dwelling communities. “Villagers are now making their environment work for them, and this gives them a sense of purpose and accomplishment as they realise that they can influence events around them” (Tewary & Isemonger ; 1998:37).

2.2.2 Co-management as a process

Co-management is more a dynamic process than a model, where each definition given is unique to a particular situation and/or place, resulting in a new arrangement, which is more likely to change over time, to give place to a more effective one.

Government’s involvement and commitment in this process require decentralisation of authority for laying the foundations of co-management. The degree of decision-making delegated by government authorities to local communities varies in any given co-management arrangements and often reflects the degree of trust among actors and the degree of community participation (Borrini-Feyerabend, 1996; Warner, 1997; Jentoft et al.; 1998). The evolution of co-management arrangements is directly influenced by the

degree of government decentralisation, as such “both co-management and decentralisation should be viewed as an evolving process that adjusts and mature over time” (Pomeroy & Berkes; 1997:477).

2.2.3 Co-management as an effective approach in the management of natural resources

There is an increasing recognition by academia, international development agencies and politicians about the effectiveness of local management practices, where communities played a greater role in the management of their resources (Fisher; 1995). Furthermore, governments from developing countries have begun to acknowledge their failures in the management and control of natural resources (Taylor; 1998). In many countries with significant forest areas, such as China, Nepal, India and Mexico, governments have adopted policies supporting the management of forests by local people, who are those living closest to the forest, and having depended on it most of their lives (Wollenberg, 1998).

On the one hand, conventional management approaches have failed to address the needs of the rural poor and to recognise the knowledge of local resource users, creating conflict instead at the economic, ecological and social level (Shiva; 1987). On the other hand, existing local forest management approaches, with the exception of selected co-management arrangements, fail to promote a more active role among local users in decision-making processes that concern the management of forest resources. This flaw can be seen in the grouping of local management approaches by Wollenberg (1998), where three types of management according to the purpose they serve have been identified:

- (i) **“People-first”, where the goal is to yield benefits for local people, with little concern about their relationship with the forest environment. The objective is “to meet local needs or maintain heritage”.**
- (ii) **“Forest-first”, the goal is to conserve forest limiting the local groups to the role of caretakers with relatively low gains it normally focuses on “stewardship”.**
- (i) **“Win-win”, the goal is to meet the needs of local groups through effective forest management. Co-management arrangements fall into this group, being the form of joint management the most commonly practised in forestry, particularly in India (Fisher, 1995; Taylor, 1998).**

Wollenberg (1998:13) argues that even though this approach is referred to as “win-win”, some arrangements remain “forest-first” based on the control exerted by the government over the resource. Although, her argument might be true in some instances, it does ignore the mouldable nature of the different types of arrangements and the principles over which co-management lay its grounds. Firstly, co-management is not a rigid set of activities: it is a dynamic process, and as such incorporates the dynamic nature of humans and their environment. Secondly, one of the main players in co-management arrangements is the government, due to the control they have over state land. The extent of its involvement depends on its effectiveness or ineffectiveness to manage the resources, as well as its ability to recognise the importance of local users’ participation. Thirdly, it is possible that some co-management arrangements might still be ‘forest first’. However we must take into consideration the increased pressure over a diminishing resource and the increasing needs of resource users. How to meet the welfare of both remains a challenge.

In spite of that, I would argue that the advantages of co-management are greater than the disadvantages. For one thing it is realistic in its approaches, by attempting to promote continued interaction and effective negotiation skills among stakeholders over resources in conflict. It also recognises the needs of having both resource-user knowledge and government intervention in the management of the resource for their benefit. Furthermore, this might be a more realistic alternative to address poverty in countries where there is a history of conflict and mistrust. Through co-management approaches, community organisation skills and conflict management within and among stakeholders could be effectively addressed, eventually empowering local users in the use of the resources for their subsistence and livelihood improvement (Borrini-Feyerabend, 1996; Warner, 1997; Jentoft et al.; 1998).

The implementation and success of co-management approaches in forestry including reforestation programs, could thrive on the basis of three key points:

Local resource users' participation and knowledge in the management of the resource
(Mohan and Stokke; 2000)

The significance of local resource user participation and knowledge is being increasingly recognised as a goal of development and conservation. Different forms of participation have been illustrated by Arnstein (See Figure 1), the level of participation moves from non-participation through degrees of tokenism to full involvement and only the three highest levels of this participation ladder are viewed as genuine participation (Fisher, 1995; Mitchell, 1997).

Figure 1: Arnstein's eight rungs of the ladder of citizen participation

Rungs on the ladder of citizen participation	Nature of involvement	Degree of power sharing
1. Manipulation 2. Therapy	Rubberstamp committee Power holders educate or cure citizens	Non-participation
3. Informing 4. Consultation 5. Placation	Citizens' rights and options are identified Citizens are heard but not necessarily heeded Advice is received from citizens but not acted upon	Degrees of tokenism
6. Partnership 7. Delegated power 8. Citizen control	Trade-offs are negotiated Citizens are given management power for selected or all parts of programs	Degrees of citizen power

(Adapted from Mitchell; 1997:159)

In most development projects participation has occurred at the lower levels of the ladder, leaving a sense of failure in the achievement of the goals (Fisher; 1995).

Local participation and co-operation in reforestation programs are of crucial importance to reach the desired goals, including long term socio-economic benefits for users and sound management practices for the environment (FAO; 1985). Reforestation is a social activity in its own right. Most of its activities involve face to face relationships among individuals and their milieu, and as such, local participation and conflict generated by their interaction would not represent a major hurdle in the implementation of a co-management strategy. This could be supported by Pinkerton's (1993:37) previous definition of co-management. Pinkerton argues that "communities which are able to play a role in management have in many cases developed ways to prevent over-exploitation of

local resources through using formal and informal mechanisms to regulate the activities of insiders and the access of outsiders". Thus, the overarching role of communities in collaborative resource management is 'dynamic participation'. The more they become involved, not just at the activity level but in the decision making process, the more power they will exert over the management of the resource (Grimble & Chan; 1995:120).

Nevertheless, full control of the resource is not necessarily required. The sense of ownership and self-confidence gained, as well as effective conflict negotiation skills gained in the process would make individuals more responsible in their management practices (Fisher; 1995). This sense of responsibility provides the individual with new roles that eventually modify its social environment (interests, values, relationships). As some authors argue, the incorporation of local knowledge and perspectives make a difference to the legitimacy and relevance of a management system (Hønneland, 1999; Jentoft et al; 1998).

Effective communication and negotiation over a resource in conflict among stakeholders
(Borrini-Feyerabend, 1996; Sen & Raakjaer; 1996)

Before effective communication and negotiation among stakeholders is discussed, it would be worth asking who are "stakeholders"? Although many stakeholder definitions are similar in their essence, the following one fully captures its meaning:

"By stakeholders is meant all those who affect, and/or are affected by, the policies, decisions and actions of the systems: they can be individuals, communities, social groups, or institutions of any size, aggregation or level in society. The term thus includes policy makers, planners and administrators in government and other organisations, as well as commercial and subsistence user groups. The fact that the term 'stakeholder' grew out of the much more restricted idea of 'stockholder' perhaps symbolises this point" (Grimble & Chan 1995:114).

Even though the term is widely used and therefore accepted in development and natural resource management, it is interesting to note the discontent of some scholars with its use. As Mitchell (1997:162) noted, citing Wiens (1995), “stakeholder” is rather an ambiguous term, and “quite contrary to the intended current application”, its etymology refers to someone who has no stake in the particular issue in question. Notwithstanding, for the purpose of this thesis, the term stakeholder will be used according to Grimble and Chan’s definition.

In any co-management arrangement, two broadly defined sets of stakeholders are identified based on the role they play in the management process. The first set includes resource user groups and government, while development agents and other private enterprises comprise the second set. Resource user groups and government are the most active and willing to take part in the process, and thus directly involved in the management of the resource. Although, their roles might vary among the different co-management arrangements, the interest, perspectives and inputs of the two are discussed and negotiated toward the achievement of a common goal. Eventually, the outcome of this negotiation process will turn into more effective communication, increasing their commitment towards the management of the resource (Borrini-Feyerabend, 1996; Sen & Raakjaer, 1996; Ingles et al; 1999). According to some authors it is the lack of commitment among stakeholders that causes overuse, conflict and potential destruction of the resource (Ostrom, 1994 cited in Memon & Selsky, 1998). However, based on studies by Fisher (1995), McCay and Jentoft (1996), Sen and Raakjaer (1996) and

Pomeroy and Berkes' (1997) conflict stands out as one of the strengths in co-management.

User groups tend to be the most complex set of stakeholders in co-management, due to the diversity of interest they represent (Ingles et al; 1999). The success of their participation in any co-management arrangement will depend on their knowledge, and their ability to negotiate effectively firstly among themselves, and secondly with the government. Their representation (the extent to which users and other stakeholders are represented) varies with the resource and context in discussion. For example, in many developing countries representation is based on socio-cultural aspects, such as ethnicity, gender and religion (Sen & Raakjaer; 1996).

Government groups play a key role in co-management and their role varies with the type of arrangements in place. In most cases, however, they hold the final authority over the resource (ibid.) Due to its responsibilities over user groups and the commons well being, their main role in any co-management approach is to build trust, "to provide enabling legislation, assistance and support to local organisation, oversee, co-ordinate and regulate local arrangements, to make sure they work" (Pomeroy & Berkes; 1997:478). However, transparency and governance issues at the local and national government level, and the degree to which national governments are willing to delegate authority to local government and communities are issues that should be foreseen. Particularly true in countries whose main national economic and political agendas are still based in natural resources exploitation. These issues could represent a major challenge in the implementation of co-management approaches due to grassroots' lack of trust

concerning government interventions and their development programs (Shiva, 1987; Goodmand & Redclift, 1991; Redclift & Sage, 1994; Taylor, 1998).

A second set of stakeholders is development agents and other private enterprises or individuals, whose interest significantly differs from that of the previous group. These differences are notably based on the parties' dependency, interest, knowledge, motivation and power over the resource. Their role is more of a supportive one, particularly in terms of funding and policy execution, and as a result their participation in the decision making process is fairly limited (Borrini-Feyerabend, 1996; Ingles et al.; 1999). NGOs, are an example of these type of groups, in some instances their role has been instrumental in the implementation of policies that benefit the management of the resource by user groups (Ngau 1986; Renner, 1986; Shiva & Bandyopadhyay, 1986; Mohan & Chee Yoke Ling, 1986).

Co-management is a dynamic process, whose strength derives from its ability to recognise conflict as part of a social process, and the complexity of the relationship among the different stakeholders (Fisher, 1995; McCay & Jentoft, 1996; Sen & Raakjaer, 1996; Memon & Selsky, 1998; Jentoft et al., 1998). Borrini-Feyerabend (1996), in her studies of co-management arrangements in protected areas has identified various constraints in the adoption of co-management arrangements. The issues around these constraints are - Who should participate? What role they should have? How can they be assisted to participate effectively? How the influence over decisions should be distributed among them? (Ingles et al: 1999:45). Even though, Borrini-Feyerabend's work evolves in the context of protected areas in sum and substance the constraints identified strongly rely on individual relations as social actions rather than the context

itself. An example would be the excessive participation of one individual or group that could result in misrepresentation of the majority's interests (McCay & Jentoft, 1996; Borrini-Feyerabend, 1996).

Ultimately, the type of co-management regime is determined by the role of users and government in decision making, the stage in the management process at which user groups become involved, the type of approach (top-down or bottom-up), the type of user group (homogeneity/heterogeneity), and political culture and social norms. Based on these parameters, the five following types of co-management arrangements have been broadly identified by Berkes (See Figure 2). These types of arrangements are:

- (i) Instructive - government informs users;
- (ii) Consultative - users are consulted but all decisions are taken by the government;
- (iii) Co-operative - government and users co-operate together (for some authors, this is the definition of co-management);
- (iv) Advisory - users advise governments of decisions to be taken and government endorses these decisions; and
- (v) Informative - government has delegated authority to make decisions to user groups who are responsible for informing back on these decisions (Sen & Raakjaer, 1996:406).

Figure 2: Berkes' Spectrum of Co-Management Arrangements

Although these arrangements have been identified, it is worth stressing the point made at the beginning regarding the flexibility of co-management arrangements. In fact there might be other types of arrangements that fall into the category of co-management that still have not been documented.

“Co-management is not a fixed unitary entity, rather it is a set of principles for institutional design that can assume various organisational forms depending on particular circumstances”. Why should one also be open to the possibility that co-management may fail or succeed? Because co-management could either fail or succeed “for reasons that have nothing to do with the model itself but the institutional and social framework surrounding it” (Jentoft, et al.; 1998:428). For instance, it is more likely for a co-management arrangement to fail when there is continuous social and political instability

(Feeny et al; 1990). An example of this situation is the Municipality of El Castillo in Southern Nicaragua, area of study for this research.

A policy framework geared towards a fair share of the benefits obtained by local resource users (Pomeroy & Berkes; 1997).

The existence of a policy framework is essential in the management and use of common resources, in order to effectively manage conflict among and within stakeholder groups and a clear understanding of each other's role and commitment. This is particularly important in the case of government, whose commitment to share power and authority with local governments and local user groups must be clearly defined through a framework that support legal rights and authority in the use of common property resources (ibid.) Key policy factors in co-management include decentralisation, land tenure, property rights, user group organisations, and benefit sharing. In many instances, these factors are reviewed on an individual basis but the relationship amongst them will ultimately influence the prospects for successful reforestation projects. A short review of these five factors follows.

Decentralisation refers “to the systematic and rational dispersal of power, authority and responsibility from the central government to lower local level institutions to states or provinces in the case of federal countries, for example, and then further down to regional and local governments or even community associations”. The main goal of decentralisation is greater participation and efficiency by promoting greater involvement of local resource users in the decision-making process and procedures affecting them. The existing forms of government vertical decentralisation include:

- (i) **Deconcentration**, this involves the transfer of authority and responsibility from the national government departments and agencies to regional district and field offices;
- (ii) **Delegation** or the passing of some authority and decision-making power to local officials. One example is, community empowerment for taking over the responsibilities of resource management and development, allowing them to implement their own regulatory measures;
- (iii) **Devolution**, involving the transfer of power and responsibility for the performance of specified functions from the national to local government the transfer is political by legislation. An example of this form is the James Bay agreement in Canada; and
- (iv) **Privatisation**, which involves the transfer of responsibility for certain government functions to NGOs or the private sector (Pomeroy & Berkes; 1997:469).

In forest resource management, including reforestation projects, land tenure is a key factor. In most cases there is lack of a supporting policy framework affecting the legitimacy of the activities. The need for a framework rests on the fact that tenure “is based on a claim to a right to use a resource, exclusively or not”. Most forestry activities take place under a ‘de facto tenure’ which differs from a ‘de jure tenure’, in that the latter is endorsed by the state and claims would, at least, be theoretically supported by it”. Claims in a ‘de facto tenure’ have nowhere to be made or heard (Fisher; 1995:29).

Feeny et al (1990), Pinkerton (1993); McCay and Jentoft (1996); Pomeroy and Berkes (1997); and Jentoft et al (1998) have done extensive work on the issue of property rights, among others. Their discussions revolve around the criticism of Garret Harding

pioneer work, “The Tragedy of the Commons” and resulting resource degradation.

Harding work has served as the landmark for the formulation of resource management policies in the recognition of stakeholder rights and their use of the commons. There are three categories of property rights in common property resources: intrinsically, their definition is based on the control and/or ownership of the resource. The categories are:

- (i) Private property, resources that can ‘physically’ be held private (e.g. land, forest), and rights that are generally recognised and enforced by the state;
- (ii) Communal property, an identifiable community of interdependent users holds resources. The rights might be legally recognised; and
- (iii) State property, rights to the resources is vested exclusively in government. This category may refer to property to which the public has equal access and use rights (e.g. highways, parks); however, the state has coercive powers of enforcement.

Through co-management arrangements, these three types of regimes are ‘potentially viable options’ that could be considered in the implementation of reforestation programs whose goals are the effective management of resources, and the environment, and the improvement of local resource users livelihood (Feeny et al.; 1990:4,5). The importance of user group organisations is crucial in the effectiveness and forcefulness of users as participants in the decision making process. The success of this process depends on the users capacity to act as a community and its ability to speak and negotiate as one individual (Jentoff & McCay, 1996; Taylor, 1998).

The ultimate goal of co-management arrangements is a more equitable management of resources and benefits sharing. These benefits materialise when

associated with co-management as the processes and the goal it pursues. They could be associated as follows:

- (i) Co-management for community based economic and social development;
- (ii) Co-management to decentralise resource management decisions; and
- (iii) Co-management as a mechanism for reducing conflict through a process of participatory democracy.

The last involves government delegation of authority and power sharing to manage the resources, which can turn out to be one of the most difficult tasks in the establishment of co-management (Pomeroy & Berkes; 1997:469).

2.2.4 Common grounds in reforestation activities for the application of co-management arrangements.

Reforestation activities could be seen from three different perspectives (biophysical, socio-political and economic) under a common approach. From the biophysical perspective, reforestation activities emerge as a result of a common resource (forest) over-exploitation, increasing tension and conflict among the different stakeholders. The increase of conflict makes reforestation an even more social activity, resulting in struggle for power and access to resources that demands the action and participation of the groups involved in the management and welfare of the resources, and the groups whose livelihood depends on that resource. Given that the basis of co-management stems from conflict over the use of the resource, access rights and fair share of benefits among primary stakeholders, it could be an effective approach in the implementation and success of reforestation activities. Through co-management

approaches it would be possible to create mechanisms at the state, and community level that would ensure the effective participation, negotiation and conflict resolution among stakeholders.

In some developing countries co-management approaches to reforestation have been fostered under local forest management arrangements. A well-documented case is the Joint Forest Management (JFM) arrangement in India. This involves a major government policy program dealing with agreements between the forest departments and local people in the management of forest resources in state owned wastelands (Fisher, 1995; Wollenberg, 1998).

Unfortunately most local forest management approaches, such as social forestry and community forestry programs, have not yet reached the levels of negotiation and involvement required in co-management (by actively participating). However, through community participation activities grassroots and government representations would be able to gradually develop the skills to become effective negotiators in any co-management agreement (Fisher, 1995; McCay & Jentoft, 1996; Borrini-Feyerabend, 1996; Sen & Raakjaer, 1996; Memon & Selsky, 1998; Jentoft et al., 1998; Wollenberg, 1998).

Co-management is a promising alternative for the implementation of potentially successful reforestation programs. Like many other management approaches it has weaknesses, however its strengths lie in the recognition of failure and conflict over resource use from previous experiences. Moreover, co-management arrangements are adaptable to any given place, time, and circumstances. As Jentof et al. (1998:426) notes,

“ Co-management means an ongoing collaborative and communicative process”, where stakeholders “are in an entrepreneurial and creative role”.

CHAPTER THREE - COMMUNITY PARTICIPATION IN NATURAL RESOURCE MANAGEMENT: A Case Study in Southern Nicaragua

3.1 Area of Study

This case study takes place within the Municipio (Municipality) of El Castillo, located in the Departamento of Rio San Juan (San Juan River Department), southern Nicaragua.

Map 1: Area of study

Adapted from Querol et al. (1996)

In order to understand the context under which reforestation activities are occurring in El Castillo, a background of the area's geography, history and socio-economic situation will follow.

3.1.1 Geography

Geopolitics

Nicaragua is divided into political-administrative units called Departamentos (Departments). Departamentos are further divided into Municipios (Municipalities) and a Cabecera Departamental (Department's Capital). Municipios consist of a Cabecera Municipal (Municipality's Capital), which represents the highest political-administrative unit within, and a number of smaller units outlined below (CGEA; 1996).

El Castillo has an area of 1 168 square kilometres with a population density of six inhabitants per square kilometre. The area is divided into 31 political-administrative units, which are categorised as comarcas (areas/sector) [26], comunidades (communities) [4], and a Cabecera Municipal. Comarcas and Comunidades, which represent 80% of the population, are rural areas differentiated by the number of houses and distance between them. Based on these parameters the Alcaldia's definition of a Comarca is an area of land where the houses are dispersed, whereas in a community the houses are in clusters. Of the 31 units, only the sector of El Castillo and the capital Boca de Sabalos is considered urban (20%) (Alguera et. al., 1994; Documenta RSJ, 1996; CGEA, 1996; INIFOM/AMUNIC, 1997; OEA/PNUMA/MARENA, 1998; Gaitan 1999, personal communication). For the purpose of this study seven areas were visited within the

Municipality: Boca de Sabalos, Las Maravillas, El Vivero, Bartola, Buena Vista, El Monico, Gordiano 1&2 and El Guasimo.

The highest political structures within the Municipios are Municipal Councils, whose highest authority is an Alcalde (Major) elected from the caucus. The Municipios basic duties include civil services; management of cemeteries, parks, garbage collection, markets, streets and slaughter houses (CGEA, 1996; INIFOM/AMUNIC, 1997). In 1988 the central government of Nicaragua, issued law No.40. in the official bulletin “La Gaceta, 02/07/88” favouring the decentralisation of local governments powers in a number of responsibilities. These responsibilities included transfer of powers to local governments over decisions in the use and management of the natural resources under their jurisdiction. Unfortunately, they do not receive the necessary funds to carry out their responsibilities effectively (DANIDA, Undated; Placer Dome de Nicaragua, Undated).

Agro-ecology and Environment

Rio San Juan is one of the three Departments forming the Southeast Region of Nicaragua. With an area of 12,700 square kilometres' this region is characterised by its many natural endowments, which have been subjected to several nationally and internationally supported development strategies. To date, the many implemented strategies have failed to address effectively the sustainable use of the area and its resources and illegal logging operations and extraction of wildlife continue.

The most important development strategies that affected the area were those implemented during the Ortega and Chamorro's regimes, in 1990 and 1994 respectively.

In 1990, the National Assembly introduced decree number 527/90 that declared and legalised the National Protected Area System (SI-A-PAZ). As a consequence, 2950 square kilometres of land covered by pristine tropical lowland forest in the region became the Indio-Maiz Biosphere Reserve with a buffer zone of 1800 square kilometers. In 1994, the president of Nicaragua declared the south-eastern part of the country a special zone for sustainable development. At the same time, as part of a decentralisation measure was created the south-eastern superintendent office (presidential decree 28-94) within the Ministerio de Recursos Naturales y el Ambiente-MARENA (The Ministry for Natural Resources and the Environment). The goal of this office was to establish a partnership, between the state and civil society in the administration and management of natural resources in areas comprised within SI-A-PAZ framework. To date, however the office has been unable to function due to political instability, contradictions between central and local government and both governments' insufficient support to the process of community participation in the decisions affecting their territory (GoN & MARENA, 1995; CGEA, 1996). As a result of these actions, the region is presently divided in three important areas for its socio-economic development (See Map 2 below).

Map 2: Classification of Development Zones

Adapted from GoN & MARENA (1995); DANIDA (Undated)

(1) Life and development zone

This demarcates an area of 7000 square kilometres, the development of this zone includes land use planning activities and agro-silvo-pastoral activities compatible with those practised in the buffer zone. The area is characterised by high investment in project development. However, according to Serrano (GoN & MARENA;1995), project components don't usually match the needs of the population.

(2) Buffer zone

This is the area surrounding the reserve and its main purposes are to stop advancement of the agricultural frontier, the management of forest resources and biodiversity conservation. The area is characterised by a number of peasant communities mostly dedicated to the farming of staple crops and raising of minor livestock (pigs and chicken).

(3) Indio-Maiz Biosphere reserve

Being the central axis for project development it is one of the less disturbed forested areas in the country and one of the richest in biodiversity (DANIDA; Undated; GoN & MARENA, 1995; Mejia et. al., 1995; CGEA, 1996).

El Castillo is located within the buffer zone (Area de Amortiguamiento) of the reserve (See Map 2). This area is characterised by humid tropical conditions, with precipitation ranging between 2500 and 4000 millimetres per year. There are two climatic seasons identified - a rainy season from May to January and a dry season from February to April. The temperatures in the area oscillate between 24 and 26 degree Celsius all year round. Based on Holdrige's classification, the types of forest formations

existing in this area are characteristic of very humid lowland tropical forest (Mejia et. al, 1995; Documenta RSJ, 1995; CGEA, 1996; INIFOM/AMUNIC, 1997; OEA/PNUMA/MARENA, 1998).

The soils of the area are classified as Ultisol⁴ - deep, of low fertility and well drained. The landscape is fairly irregular, with the presence of few escarpments with slopes between two and 75%, and elevations reaching heights of 300 metres above sea level (m.a.s.l.) The potential use of soils in the area of El Castillo corresponds to 70% for forest use, 18% for agroforestry and 12% for agricultural use. However, the actual use of soils in the area is slightly different. Firstly, between 50 and 60% of the area is forested and it has undergone several years of commercial exploitation, particularly in the 1980's. Secondly, the colonisation of the area is rapidly increasing the advancement of the agricultural frontier. In addition, the various agricultural activities and farming techniques practised are alien to the potential use of the soils in the area (DANIDA, Undated; CTFSN, 1994; Mejia et. al, 1995).

Rio San Juan is the second most important river in Nicaragua, supporting a complex network of rivers and streams. The area belonging to the Municipality of El Castillo is surrounded by two important watersheds: (1) the San Juan River watershed, with an area of 17,1000 hectares. In this watershed are all the tributaries and streams from southern Nicaragua and northern Costa Rica, forming the legal border between the two countries. From the Nicaraguan side the two major tributaries are the Santa Cruz and Sabalos Rivers, which are also located in the buffer zone. (2) The Indio River watershed

⁴ Developed from basic rocks such as Andosite and/or basalt

with an area of 103,000 hectares also flows in the San Juan River, along with its many streams comprises the Indio-Maiz Biosphere reserve. The San Juan River represents one of the most reliable and important river transportation systems for communities living in the area. The river also facilitates the commercialisation of local goods in the rest of the country and Costa Rica (Alcaldia del Castillo, Undated; CGEA, 1996; Ortega-Alarie; 1999).

3.1.2 History

The emergence of San Juan River as a political Department is relatively new since it was only separated from the Department of Chontales in 1949. For many Nicaraguan historians, San Juan has been the doorway to Nicaraguan history - from repeated invasions, to an area of transit, economic enclave and border disputes with its southern neighbour (Rabella, 1995; CGEA, 1996).

The colonisation of the area has been marked by three national political-economic events. From the nineteenth-century and extending through to the 1970s, was characterised by the establishment of banana plantations and extractive enclaves such as rubber and timber logging. This political-economic regime resulted in a massive transfer of indentured labour from the Pacific tropical drylands into the San Juan River area. With the decline and eventual ending of these activities the new immigrants, who had little or no knowledge of farming in humid tropical lands established themselves in the area. The newly established groups started implementing farming practices characteristic of their region of origin.

In 1950, the Somoza regime established cotton plantations in large areas of the Pacific coast stripping large groups of peasants from their land and traditional farming practices. The displaced groups moved to the southern part of the country in the search for land, as a result, the largely forested tropical land areas of San Juan River were once again exposed to inappropriate farming practices. The migration of these groups marked a milestone in the economic development of the area and an advancement of the agricultural frontier⁵ (CGEA, 1996; Acevedo-Vogl, 1998).

In 1979, after nearly fifty years of dictatorship, the Sandinista Revolution overthrew the Somoza regime. The end of the Somoza dictatorship marked the beginning of a ten-year internal war between the Sandinista government and the Contra revolutionary groups. During this ten-year period, Contra revolutionary groups who received steady military and financial support from the US government concentrated their activities in areas around the Northern and Southern borders. In this way Southern Nicaragua became a war zone, halting further migration of population into the Department and its further advancement of the agricultural frontier.

In 1988-1989, the Sandinista government had initiated a national peace process. At the same time national elections took place and the Sandinista party lost to the Union Nacional Opositora-UNO (National Opposition Union) party and its candidate Mrs. Violeta Chamorro. Chamorro's election in 1989 ended the ten years of war and economic restrictions imposed by the US government, consequently resuming further migration and

⁵ The agricultural frontier describes a transition zone between primary forest growth and agricultural lands (Acevedo-Vogl; 1998: 216)

advancement of the agricultural frontier in Rio San Juan. The national census demonstrated a great increase in the department's population in the early 1990s, from 20,832 in 1971 to 70,875 inhabitants in 1995. This last period marks an important landmark for socio-economic change in the most remote areas of the Department, including the Municipality of El Castillo (Fitzgerald, 1985; CGEA, 1996).

The ten-year war has been the greatest agent of change in the Municipality. The socio-economic study done by Alguera et al. (1994:10,11) in the area identified two key historical periods. The period from 1980 to 1989 is characterised by the existence of urban and rural centres with an approximate total population of 5000 inhabitants.

Existing political divisions within the Department were geographically situated in concordance with government development programs and public services offered during the Somoza's regime. The existing urban centres were El Castillo (1400 inhabitants), Boca de Sabalos (Capital, 400 inhabitants) and Buena Vista (1500 inhabitants). The remaining 1700 inhabitants were distributed among three established communities and six comarcas, which due to road conditions were relatively isolated from the rest. A determining factor for low population during this period was the migration to either safer Departments (located in the central area or along the Pacific central coasts) or to Costa Rica.

The second period, from 1990 to 1994, is characterised by a doubling of the population, from the previous 5000 to 10,000 inhabitants. This increase in population resulted from the 1988-1989 peace process, causing the repatriation of political and economic exiles that were either landowners or new colonos coming back into the area.

An increase in rural population and the creation of entire new communities within naturally forested areas transformed the landscape and renewed the advance of the agricultural frontier. Four additional communities and sixteen comarcas were created during this period.

The political changes from 1980 to the late 1990 demanded new economic activities and the re-opening of logging operations in the area. Through its national agenda and local government representations, the Sandinista regime facilitated access to old communities and influenced the geographical location for the establishment of newer populated areas. Logging roads opened by the government owned company-COREXSA became access roads for isolated communities, and favoured the establishment of new ones. Another phenomenon was the emergence of single-economic activity oriented communities such as Buena Vista, where approximately three quarter of its population were once dedicated to the extraction of Ipecac roots. An existing example of this type of community is El Vivero, where approximately 90% of its population is still involved in African palm oil production activities. Progress in road access and maintenance came to halt in 1996 with the election of the neo-liberal government presently in power. However, with the help received from international solidarity and development institutions between 1990 and 1996, the local government has been able to give maintenance to existing roads and open new ones for the communities of Las Maravillas and La Quezada (Gaitan 1999; personal communication.).

3.1.3 Socio-Economic Context

The Municipality of El Castillo, situated on the Southern side of the River San Juan, has been separated from the rest of the country; the river being the only means of transportation. This situation, along with ineffective governmental development and political strategies has had a negative impact in its socio-economic development. Presently, the Municipality and its surroundings are characterised as one of the poorest and least developed areas of the country. However, its proximity to the Indio-Maiz reserve has gained it a coveted status in the development of conservation and sustainable development projects as well as government and private investments. Many of these projects have aimed at stopping the advancement of the agricultural frontier while helping to improve the locals' livelihoods. Unfortunately, they were not successful, because they failed to actively involve the communities and to help them address their needs. Instead they have concentrated on land productivity, credits and incentives, and access to basic services (Alguera et. al, 1994; GoN & MAREMA, 1995).

Eighty percent of the population in the Municipality is rural, with no access to potable water and electricity, and limited access to health and education programs. The lack of these services has had a negative impact on the health of the communities and on the environment. Some communities have limited access to rural health centres, which are poorly staffed and inadequately supplied. The people of the area rely mainly on subsistence agriculture, which usually involves the production of basic staples and livestock. In some cases, production surpluses are sold to buy other goods, such as

laundry soap, cooking oil, sugar and salt (Alguera et. al., 1994; Documenta RSJ, 1995; INIFOM/AMUNIC, 1997; OEA/PNUMA/MARENA, 1998).

There are other ongoing economic activities destined to the international market. Such activities include the commercial extraction of timber by PLWOOD Corporation. The production of palm oil by the Chamorro Company and the Union of African Palm Co-operatives (DANIDA, Undated; Alguera et. al., 1994; CGEA, 1996). The extraction of Ipecac roots [*Psychotria ipecacuanha* (Brot.)] (Querol et. al., 1996) used to be a major economic co-operated activity in the area. However, the decline of international prices caused by surplus production resulted in the dismantling of entire co-operatives dedicated to this activity. Ipecac roots extraction activities are now being done by only a few individuals, who sell the product in local and regional markets (Alguera et. al., 1994; Gaitan 1999, personal communication; Ortega-Alarie, 1999). Eco-tourism is another economic activity that is increasingly growing in the area. This activity mainly targets an international and regional clientele and to a lesser extent a national clientele. Although most activities of this nature are run by private individuals, a few informants reported that some Costa Rican tour operators bring tourist inside the Nicaraguan border without a permit.

3.2 Context in which Reforestation is Being Taken

3.2.1. Phase I of reforestation - Selection and implementation of the project

In 1995, the European Community (EC) through the Alcaldia of El Castillo, funded a reforestation project for one year (August 1995-December 1996). The objective

of the project was to mitigate the damage caused by deforestation in the watershed of the Sabalos and Santa Cruz rivers, the two major tributaries to the San Juan. The funds for this activity were limited (US\$40,000) and so the Alcaldia decided to focus activities in the section of the watershed that needed immediate attention.

Based on the results showed in the Diagnostic Study “Estado de las cuencas de los rios Sabalos y Santa Cruz” (The state of the Sabalos and Santa Cruz Rivers watershed) by Mejia et.al. (1995), environmental deterioration was more severe in the lower section of the watershed, where population densities were highest. Addressing environmental problems of this magnitude was beyond the scope of what could have been with resources available for phase one and therefore it was necessary to search out an alternative region. Overall, the Alcaldia assessed that it could have a positive impact in the mid-high section of the two watersheds.

The restrictions of available funds resulted in the Alcaldia’s implementation of a first phase with the participation of only eighty families from six communities located along the mid-high section of both watersheds. Along Sablaos watershed the communities selected were Buena Vista, Gordiano 1 &2, Guasimo and Goyo Boca. Along Santa Cruz watershed the communities selected were Las Maravillas and El Monico (Alcaldia del Castillo, Undated ; Oporta et al, Undated). Halting watershed erosion was a priority and 80 families whose farms were located along the riverbeds in these watersheds were selected. The diagnostic study confirmed that accessibility to the river is the principal factor in the location of farmers’ homes. The farmers usually built their homes approximately 10 to 15 meters from the river and in the process cleared

timber and other land cover, summing 1.4 hectares (0.014 Km²) of watershed (Alguera et. al., 1994; Mejia et. al., 1995).

The peace process initiated in 1988-1989 (Acevedo Vogl; 1998), and the resulting repatriation of population displaced by the war, has increased the demographic pressure on the watersheds and the existing natural resources of the two rivers. The pressure is such that food security of the campesino⁶ families is at stake. Political instability and local elections were major obstacles affecting the continuity of the project. The Non-Governmental Organisation (NGO) Guises Montaña Experimental (GME) with the support of Third World Initiative (TWI) submitted to the European Community (EC) for further funding, a proposal for a second phase. Among other things, this second phase is expected to address obstacles encountered during the first phase, for example the exclusion of women during the first phase. This proposal contemplates a more integrated approach to the management of natural resources. Finally in 1999, negotiations resumed between TWI and EC resulting in the funding of a four-year reforestation project, which has recently commenced.

The fieldwork for this thesis focused on the first phase of the reforestation project. In some instances, however, reference to the second phase will be made due to my commitment with GME to participate in the planning sessions for the second phase.

⁶ Popular term used for peasant

3.2.2. Other reforestation programs

Besides The Alcaldia's reforestation program, further reforestation activities have been implemented by other NGOs that operate in the area. There are cases where the same household and or individual has participated in more than one reforestation project.

3.3 Tools to Understand the Role of Reforestation in Community Development

3.3.1 Methods Used

Qualitative tools were used for this study. Among the tools used were participants' observations and field diary (Schoonmaker; 1994); informal and open-ended interviews with information rich cases⁷, focus groups⁸, and key informants⁹. Two main considerations were the reasons to select the methodology and tools used. Firstly, based on the objectives of this research the information to be collected was around individual's perception on socio-economic, cultural, political and environmental issues. Secondly the most reliable and accessible way to carry on with the interview in the area of study was through qualitative enquiry, due to weather conditions, time, access and limited funds.

⁷ Information-rich cases are those from which one can learn a great deal about issues of central importance to the purpose of the research (Patton; 1990:173).

⁸ Focus groups interviews are typically based on homogenous groups. It involves conducting open ended interviews with groups of five to eight people on specially targeted or focussed issues (ibid.)

⁹ Key informants are people who are particularly knowledgeable and articulate, whose insight can prove particularly useful in helping an observer understand what is happening (Patton, 1990). In this particular case these individuals have worked for various organisations in the area and know well the communities (ibid.).

Rationale

The rationale for choosing the tools used was based on two facts; firstly the need to stimulate individuals' participation and confidence necessary to collect the type of information sought. At this point the researcher's role was more of a facilitator (Schoonmaker; 1994). Secondly, the reforestation project implemented by the Alcaldia worked only with households and communities along the rivers. This fact represented a great challenge in the implementation of the methodology, particularly when taking into consideration existing biophysical and safety conditions of an area marked by a ten-year war. Using a methodology that requires a great number of samples and quantification would have been unrealistic. Most communities in the area are only accessible by foot, in some cases it took up to a full day's walk to move from one community to another. This added to the lack of visible roads, heavy clay soils conditions and constant rain (usually 3 dry months per year) did not provide an ideal scenario for the application of intensive quantitative methods.

The use of quantitative methods in this area would probably require a higher budget and a greater number of field staff. The conditions of the area, the amount of funds available for the research and the type of information sought called for a flexible methodology that unfolds as fieldwork unfolds.

Figure 3: Methodological framework used (Adapted from Patton 1990:385)

Selection of Individuals

GME provided me with list of individuals (80 families) that participated in the first phase of the project and individuals from 170 families that will participate in the second phase. The list included the name of individuals, area of the farm and each person's community. The selection criteria were based on gender equity and participation on reforestation projects with particular interest in the first phase promoted by the Alcaldia. Interviews were performed with 16 individual families and two women's focus groups. In most of the interviews the whole family participated.

Four interviews were also carried out with key informants that have been working in the area for some time. The information provided by them was particularly useful for the understanding of grassroots idiosyncrasy and identification of topics, which needed either to be avoided or carefully approached. For instance, I was advised to avoid topics about political orientation and carefully approach topics around power relations in the household, especially in male-headed units.

Gender criteria were of great importance at the time of the interviews for two reasons: firstly, because of my commitment with the funding institution to incorporate gender dimensions to the study. Secondly, because of the technicians' masculine perceptions in project planning and development, most activities underestimated the role played by women in income generation activities. Women were denied an active role in the first phase of reforestation and relegated instead to their 'perceived' traditional roles of housewives and labourers. However, the results from the first phase of the project

changed the perceptions among participants and co-ordinators about the key role women play in the management of the farm and income generating activities.

During the interviews, men and women were given equal opportunity to participate and speak. The age of the interviewees varied from 11 to 65 years approximately. All individuals were interviewed, regardless of their status and political affiliations.

Ethical Considerations

Ethical considerations were made at two different levels. At the level of the hosting NGO, the topics for the interviews were discussed ahead of time with the field staff and project leader from GME. At the community level, informed consent was obtained from all interviewees in the field. Prior to the interview commencing each participant was reassured of the confidential nature of the interview. All the individuals were interviewed in Spanish whilst the information was transcribed in English. Interviews, field notes and diaries were kept under my care at all times. Interviewees were made aware of their rights to access the information resulting from the fieldwork once it is ready for distribution by GME field staff.

3.3.2 Description of field work

The fieldwork was carried out in three stages:

First stage (2 weeks)

This time was dedicated to my familiarisation with GME and its activities within the area of study. On various occasions I conducted informal unstructured interviews with members of the technical and support staff. Most of the conversations focused on the rationale, objectives and impact of a second phase of reforestation and only occasionally were the conversations about the NGO structure, its functions and various development and research activities. I assisted GME in the finalisation of the funding proposal for the second phase of the reforestation project. At the same time, I collected relevant information such as maps, socio-economic and environmental studies on the Municipio. During this stage I also identified institutions that do similar work in the area of study.

Second stage; (reconnaissance field trip- one month)

This trip was made in the month of March 1999 and provided me with first-hand knowledge of the Municipio and its surroundings. This involved exploratory visits to two communities, field observations and informal interviews. These interviews were conducted with key informants from Boca de Sabalos, which is the Cabecera Municipal¹⁰. The visits usually took a full day and the interviews lasted between two to three hours.

¹⁰ In the Municipio all government institutions and NGOs have representation.

In this stage, as part of my agreement with the host institution (GME) I participated in strategic planning sessions and workshop preparation for the second phase of the reforestation project. The second phase added participatory dimensions to the various activities planned for the management of natural resources in the area. Main activities will involve participatory management of the farms, reforestation around water bodies and equal participation of men and women. These planning activities provided me with the opportunity to identify and contact the ideal persons to assist me during the fieldwork. The persons identified, a male and a female, are well known in the communities and have been working for some time in the area. With their help I was able to do necessary logistical arrangements to resume the fieldwork.

Third stage; (this stage consisted of two field trips- four weeks).

The first trip (three weeks) was made during the month of April 1999. Fifteen consecutive days were dedicated to open-ended interviews and living with the selected campesinos. Because of the extremely high cost of commuting in the area, the greatest number of interview sessions took place in this stage. Interviewees were not advised ahead of time about the interview because access to the communities was only possible by foot and distances between farms were long (See Map in Annex 1). In spite of that, the selected campesinos were keen on taking part in the interview and in most cases the whole family participated.

Open-ended¹¹ interviews were used with a questionnaire (See Annex 2) prepared ahead of time. The interview started with amiable greetings and conversations about common interest topics, such as weather and road conditions and medicinal use of plants. Later the interviewee was told about the purpose of our visit and asked to participate, only if he or she wanted to do so. If they decided to participate, they were informed ahead of time about the personal nature of some of the questions, which they were free to either answer or skip.

The number of questions asked was based on my perception about the individual enthusiasm and keenness to talk. If the interviewee was sociable and co-operative the field assistant and I would usually start with a general conversation and then proceed with the full questionnaire. This approach was avoided with an individual who expressed his vexation and mistrust over the project, he seemed rather impatient during the interview. The same approach was also avoided in the case of the individual from Goyo Boca (the farthest community), who religiously attended his Sunday service in the community (Guasimo) we were stationed at. Due to time and distance constraints we decided to ask him general questions about his community and specific questions about his participation in the reforestation activities. Specific questions about reforestation were asked only to individuals that participated in the project.

In the questionnaire there were also specific questions for women's focus groups and female-headed households (See Annex 3). The majority of individuals discussed

¹¹The purpose of this type of interview is to access the perspective of the person being interviewed. This is usually done to find out from them those things we cannot directly observe (Patton; 1990)

most topics with ease. Some became particularly excited when they were given the opportunity to express their opinion about project impacts and results. However, there was a degree of difficulty around discussion on gender issues among male-headed households, contrary to the attitude in female-headed household and their male partners. Overall, most individuals were exceptionally friendly and demonstrated interest about our goals, background and personal lives (the field assistant and myself). In several occasions the dynamics of the interviews provided insightful discussions about politics, gender and other issues. It also provided the opportunity to ask questions different from those of the questionnaire, for example around family health and education subjects.

A day's work consisted of two semi-structured interviews, with each session lasting approximately three to four hours. Some sessions were carried out by candle light in their kitchen, the stable or in their field. During the interview, participants were told that they could have access to the results of the study through GME if they wished to. The same topics were discussed with all interviewees and included:

- Personal profile (name, age, marital status, education, number of children, etc.);
- The reforestation project (extent of participation, expected outputs and impacts);
- Perception on community issues (place of origin, community organisations, taxes);
- Farming and economic activities of the household (ownership, type of crops, etc.);
- Perception on their environment (about deforestation, project's impact, etc.); and
- Role of women (role in farm management, perception about their role, etc.)

This part of the activity turned out to be the most strenuous, and at the same time the most rewarding.

Part of my agreement with the host institution included an assessment of training needs for women in some communities of the Municipio. To fulfil my agreement with GME and taking advantage of my presence in the communities, I also incorporated questions relevant to their needs in my interviews. For this purpose, interviews with women that did not participate in the reforestation program were also included. The results of the interviews were partially used in the elaboration of the document “Diagnostico de las Necesidades de Capacitacion para Mujeres en Tematicas de Interes (Rapid Assessment of Training Needs for Women in Topics of Interest), Municipio del Castillo, Departamento de Rio San Juan, Mayo 1999”.

The second trip was made in the first part of May 1999. The time was allocated to the collection of information and visits to relevant NGOs and government institutions in San Carlos. I took this opportunity to conduct a more formal open-ended interview with the project leader for the first phase and the upcoming second phase of the reforestation project. During this three-hour open-ended interview we spoke about the outcomes, impacts and problems during the first phase of the project as well as the rationale and objective for a second phase. Prior to this interview informal conversations were held with him in various occasions.

3.4 Analytical Procedures

Analysis of data collected in the field took place in two stages. A detailed description of the steps involved in each stage will be given after a brief outline on the number and sources of information used.

3.4.1 Organisation of the data

A total of 20 open-ended interviews (See Table 1, pp62), four informal conversations and two focus group sessions were completed. Sixteen of these interviews were with members from selected communities; eight out of this total participated in the first phase of the reforestation project. The remaining four interviews and informal conversations were done with key informants from the area, including the leader of the project. In addition to the interviews, there were organised two focus groups with communities that will be participating in the second phase of the reforestation project.

Although, the remaining eight members from different communities and the two focus groups interviewed did not participate in the first phase of the Alcaldia's reforestation project, the information provided by them was also analysed. The reason for including these interviews in the analysis was based in two considerations. Firstly, to bring into effect my agreement with the host institution on the assessment of training needs among women that participated in the first phase of the project, and women that will be participating in the second phase (to be implemented by GME). Secondly, during the indexing of information, data collected among this set of informants demonstrated to be of tremendous use in the identification of key socio-economic, political and environmental issues, which ultimately affected reforestation decisions. This information provided considerable insight into the area, the communities and the politics surrounding the management of natural resources at the local level.

The first stage taken in the analysis involved the organisation of support data, field notes/observations and interviews. The organisation of support data refers to the

compilation and grouping of support information for the first and second phase of the reforestation project, support information about the area, stakeholders and co-management. Field observations and interviews with key informants were transcribed using word processing programs. Interviews with community members did not need to be transcribed due to the presentation and clarity of the notes.

The second stage involved the actual analysis of interviews and field observations. Their analysis was based on three facts; firstly, on the research questions and objectives laid during the thesis proposal stage. Secondly, on insights and interpretations that emerged during the fieldwork. Thirdly, on further questions that emerged during the review of literature. The activities entailed in this step required long hours of work and cautious thinking, as appropriately depicted by Patton (1990:379) in his chapter on qualitative data analysis, this is “a painstaking process requiring long hours of work going over notes, organising the data”.

3.4.2 Content Analysis

The case study approach to qualitative analysis was considered the most appropriate for result analysis in this research. According to Patton (1990:384), the purpose of case study approach “is to gather comprehensive, systematic, and in-depth information about each case of interest.” Consistent to the approach selected was also the strategy used in the analysis of the interviews.

Cross-case analysis was considered the ideal strategy in the analysis of interviews, given that the primary focus of the study was to analyse different perspectives

(represented by every individual interviewed from the different communities) over a common issue (reforestation). “Cross-case analysis means grouping together answers from different people to common questions or analysing different perspectives on central issues. If a standardised open-ended interview is used, it is fairly easy to do cross-case or cross-interview analysis for each question in the interview.” Patton (1990:376)

The first step was to prepare the grid (see next page) for indexing of interviews and informal conversations recorded during the fieldwork. This approach helped organised and track information, thus facilitated the elaboration of matrixes and maps to analyse and disaggregate data.

Table 1: Interview Indexing Grid

Community ¹²	Name ¹³	Phase ¹⁴	Category ¹⁵	Interview Date ¹⁶	Location ¹⁷
Watershed: Santa Cruz					
Las Maravillas	1 female	2	Interview		
El Vivero	Women group 2 females	2	Focus group Inf. conversations		
El Monico	1 male 1 female	1	Interviews		
Bartola	Women group 1 female 1 male	2	Focus group Inf. conversations Interview		
Watershed: Sabalos					
Boca de Sabalos	1 male 1 female	2	Interviews		
Buena Vista	1 male 1 female	1-1pers. 2-1pers.	Interviews		
Gordiano 1&2	2 females 2 males	1-3pers. 2-1pers.	Interviews		
Guasimo	1 male 1 female	1-1pers. 2-1pers.	1 interview 1 inf. conversation		
Goyo Boca	1 male	1-1pers.	Interview		
Others					
Project Leader			1 interview 3 inf. conversations		
Key Informants			Unstructured interviews		

¹² Indicates the communities visited by watershed.

¹³ Names of individuals interviewed in this column were omitted due to confidentiality purposes; instead they were identified by gender. The fact that only single individuals are indicated in the grid doesn't necessarily mean they were the only participants in the household.

¹⁴ The two phases of the reforestation project, 1 for phase one and 2 for phase two.

¹⁵ Indicates the type of tools used.

¹⁶ Interview dates.

¹⁷ Indicate where each interview is located in my notes.

With the aid of the grid, field observations were also organised by issues for their analysis. The idea here was to pull together key issues around the research theme that will be later incorporated in the overall analysis of topics identified.

The second step was carried out in three stages. The overall purpose was to classify the data into packages that will allow easy access to the information sought by key issues. The first stage involved the assembling of raw data into a matrix by objectives, where each one of the objectives assessed were compared to each of the communities involved in the study (See Table below). This stage considered the eight selected individuals that participated in the first phase of the reforestation project and key informants.

Table 2: Matrix by objective

Communities Objectives Research questions	Gordiano 1&2	Buena Vista	El Monico	Guasimo	Goyo Boca
A. Decisions regarding selection/implementation of reforestation programs					
1. How does social dimension of community influence reforestation activities					
2. How does land tenure affect reforestation activities					

The second and third stage within this step involved the elaboration of a map (See Table below) for the identification of key actors and their roles and a conflict matrix, respectively.

Table 3: Key Actors' Identification Map

Actors¹⁸	Roles	Key Environmental Issues/Concerns	Strengths	Weaknesses
1. Grassroots				
2. IFI				
4. State				
5. NGOs				
6. Business				
7. Others				

Although this map only depicts broad categories by actor, during the data analysis sub-categories within some of the categories identified were also mapped. Below is provided a breakdown of sub-categories identified. Examples of actors' roles, concerns, strengths and weaknesses by sub-categories will be given in chapter four.

1. Grassroots – the sub categories identified in this set of actors are farmers, settlers and communities.
2. International Funding Institutions (IFI) – in this category were identified two main institutions with stakes in the area. The Danish Development Agency (DANIDA), a

¹⁸ Key actor denominations are based on Bryant and Bailey's (1997) definitions of key actors in Political Ecology.

bilateral institution and the Global Environmental Facility, a technical multilateral institution from the World Bank.

3. **State** – within this category there were identified two main sub-categories, local government represented by an Alcaldia and its Major, and central government. The central government sub-category reckons central government delegations in the area of natural resources management.
4. **Non-Governmental Institutions (NGOs)** – there were two sub-categories identified in this set of actors. Local NGOs who are mostly dedicated to community development and environmental issues. International NGOs who usually channel project development funds through local NGOs, and occasionally work directly with the communities and locally hired staff.
5. **Business** – there is not a differentiated set of sub-categories within this actor. For the purpose of this study this term refers to existing politically influential family business and local corporations.
6. **Others** – this category includes individuals interacting within the Municipality's environment at various levels. It includes academic institutions, passers-by and illegal migrants to Costa Rica.

A conflict matrix (See Table below) was created and employed to identify and assess the type and level of conflict within and between actors. This information was disaggregated to breakdown conflict by key theme and each key theme by issue. Key issues identified were ranked based on the frequency found during the data analysis. For

example, one of the key themes is the use of local natural resources, where conflicts caused by cattle is the most frequently expressed issue.

Table 4: Conflict Matrix

Actors	GR	LG	CG	LNGOs	INGOs	BUSS	IFI	Others
GR¹⁹								
LG²⁰								
CG²¹								
LNGOs²²								
INGOs²³								
BUSS²⁴								
IFI²⁵								
Others								

Both exercises were of great importance in the identification of key issues encompassing the management of local resources. All the information collected in the field was taken into consideration and analysed for the accomplishment of the last two stages. However, it is worth noting that regardless of the stage analysed there is unquestionable

¹⁹ Grassroots

²⁰ Local government

²¹ Central government

²² Local non-governmental organisation

²³ International non-governmental organisations

²⁴ Business

²⁵ International Funding Institutions

connectivity among actors and key issues, manifest in the presentation of results and discussion.

The next chapter will be built upon the information collected during the fieldwork. The results will be discussed and the findings will be crafted into the context of co-management arrangements in the management of natural resources. Based on the findings, it will be explored the possibility of integrating a co-management arrangement to carry on reforestation activities in the context of El Castillo. An arrangement that satisfy the needs of the different stakeholders involved, while making sustainable use of the area and its natural resources.

CHAPTER FOUR – RESULTS AND DISCUSSIONS

4.1 Co-Management as an Alternative in the Management of Local Natural Resources

4.1.1 The politics of natural resources management in El Castillo

The situation of natural resources in the Municipality of El Castillo and the surrounding politics over these have had a direct influence in the attitude and ways of interaction among the different actors. The repeated migrations in the area under various economic regimes and political instability at the national level have had a direct impact in the actual condition of the resources and quality of life among grassroots. This economic and political instability coupled with inadequate knowledge about the economy and management of tropical ecosystems by recent immigrants have worsen the levels of poverty and re-inforced historical, economic and political marginalisation (Bryant & Bailey; 1997:32) of local grassroots.

These historical process, their outcomes and impacts on the local environment and livelihoods helped shape the use and management of the resources. Clearly the prevailing political character on the region was instrumental in defining resource use and management. This line of reasoning is developed elsewhere by Harvey as reported by Bryant & Bailey (1997:5) where it was noted; “all ecological projects (and arguments) are simultaneously political-economic projects and arguments and vice versa. Ecological arguments are never socially neutral any more than socio-political arguments are ecologically neutral”.

To fully understand the politics around the resources in the area is necessary to firstly provide a brief background about the distribution of land. Secondly, to identify who are the main actors are and the role they play in the management of local resources and in the implementation of development projects.

4.1.2 Land tenure issues

Preceding the 1980s, the culmination of colonisation in Rio San Juan Department took place with the inscription of possessed lands granting legal ownership to few individuals. Only a few farmers benefited from this process, as politically influential and wealthy individuals retained most of the land. In the 1970s alone, 87% of the land in Rio San Juan was in the hands of large state owners. However, the unequal distribution of land in this area changed shortly after the Sandinista Revolution victory, with the implementation of an agrarian reform in the 1980s. The reform resulted in the re-distribution and the confiscation of land from large state owners, who in dissatisfaction with the new political model fled the country (Médicos del Mundo; 1998).

The 1989-1990 peace process implemented by President Chamorro contemplated a series of actions that will eventually have a direct impact in San Juan's socio-economic development. Among these actions was the promulgation of the following measures:

- The repatriation of political exiles including large state owners and counterrevolutionary groups;
- The reallocation of peasant families that lost their farm during the ten-year war; and
- The considerable reduction of the Sandinista army.

The burden of development and political change again fell on local natural resources. With this strategy the President intended to resolve war conflicts by returning the land to legal owners and allocating land to peasant families, ex-member of counterrevolutionary groups and ex-members of the Sandinista army. In the area of El Castillo, some of the lands abandoned by their legal owners were already occupied by one of the groups mentioned. In order to minimise conflict the government assessed the value of the lands and pay its value in cash to the legal owners.

In spite of government measures, conflicts over land tenure among grassroots and occasionally land owners in the buffer zone continued until the legal parcelling of land by the Insitituto Nacional de Reforma Agraria-INRA (National Institute of Agrarian Reform) took place in 1994. During this process landless individuals from the above mentioned groups were granted 35 hectares of land each. The individual became legal owner once the property was measured and registered by INRA. Up to 1995, 8339.8 hectares of land had been parcelled granting legal ownership to 454 families. By Presidential decree, the head of the household, and usually, his partner were given equal rights over the legal ownership on the land, meaning that one partner could not sell the land without the other's consent. In 1996 the international organisation Cooperación Española (Spanish Co-operation) through a rapid gender appraisal assessed the degree of marginalisation amongst women in the process. Their results were compared against data provided by the Union Nacional de Agricultores y Ganaderos-UNAG (National Farmers Union) in the area (SI-FEC; 1996). The differences between the data sets was substantial and eclipsed Chamoros' intention to recognise the role of women in the rural

economy. The following table shows the differences between UNAG data and the Spanish Co-operation findings.

Table 5: Data Comparison on Farm's Ownership

Classes of Ownership Title	UNAG (%)	Spanish Co-operation (%)
Title under women's name	22.6	7.7
Title under both partners' name	20.6	15.4
Title under the whole family	Not available	3.8
Total²⁶	Not available	Not available

At the time the fieldwork for this research took place most individuals possessed legal rights over their land. However, four of the 16 individuals interviewed have not gone through the legal inscription procedures to obtain a title deed. These individuals still remain under the ownership category "right by possession", which grants him/her the legal ownership right to the land he/she has been inhabiting for more than five years. The procedure to obtain a title deed for an individual under this category involves visits to the judge to request a supplementary title, which must be later given to a notary for the elaboration of a notarial deed. Once this is done he/she must go to the land registry office to obtain a title deed for the land (Gaitan, 1999; personal communication). Interviewees claimed to remain in this status due to the lack of funds to cover costs incurred in the

²⁶ It is possible that remaining percentages account for either titles under the male partner's name or unmeasured lots by INRA

obtaining of a title deed. Meanwhile, individuals with a notarial deed have not legally registered it in order to evade taxes (See Table below) – many claimed “we are too poor to pay” but one of the individuals interviewed who asserted her inability to pay taxes was in fact among the wealthier group of interviewees. She and her partner own a 70 hectare farm with 30 head of cattle and also raise pigs for sale at the local market. This attitude could be interpreted as a pattern of resistance resulting from political instabilities at the local and national levels and also signals an increasing lack of trust by government use of funds. Overall these attitudes perpetuate tax evasion at local through national levels.

Table 6: Land Use Tax Rates

Farm Area (Ha.)	Types of Land Use²⁷	Yearly Fee/0.7 Ha. (\$ Cordobas)²⁸
0.7-70	Mountainous area	2
	Grass areas	3
70-140	Mountainous area	3
	Grass areas	4
More than 140	Mountainous area	4
	Grass areas	5

Although the established taxes are relatively affordable for most individuals there is a need for a mechanism, such as monthly instalments, to facilitate the transactions for the poorest farmers. The poorer farmers typically own between 12 to 35 hectares with

²⁷ Mountainous areas are mostly dedicated to inter-cropping activities for semi-shadowed crops like cocoa and ground provisions. Grass areas are mostly used for cattle grassing and the production of cash crops like rice, beans and maize.

²⁸ The estimated currency rate is \$12 Cordobas X 1 Canadian dollar.

very limited access to cash and in most cases requires selling their labour to a wealthier farmer for \$25 Córdobas per day.

Another evolving phenomenon in the area seems to be the selling of lands allotted by INRA during the peace-process. Five of the 16 interviewees reported to have been involved in the land transactions, either by selling that was given to them or buying from another individual. In the case of the latter the rights over the acquired piece of land is at the “possession” status due to INRA’s regulation around selling and transferring of allotted lands. According to an interviewee and an informant these lands can only be sold or transferred five years after their concession.

4.1.3 Who are the Stakeholders?

In the area of study, eight types of stakeholders interact with each other either via the use or management of the land resources. These groups include: grassroots, local government, central government institutions, local non-governmental organisations (NGO), international non-governmental organisations, business, international funding institutions (IFI), and others. Brief descriptions of these groups were presented in section 3.4.2 and are developed further in this section.

Grassroots Actors

Further categories were identified within this group; the division is basically rooted in their access to the land and resources, meaning by resources, natural endowments and resources for basic human needs, such as health and education. These divisions make this particular group the most dynamic and prone to conflict. Because of

the complex and differentiated nature of each category it becomes necessary to provide a brief profile of each sub-group. As the result from the conflict matrix shows, the greater deal of conflicts nurtured within this group are amongst the different sub-groups.

(i) Farmers

The common denominator within this class is the legal possession of their land. The area owned varies greatly according to the amount of cash and wealth accumulated and the length of time the individual has lived in the area. In some cases, the area owned by an individual depends on his/her nexus or association with the political party in power. Three different types of farmers were identified within this group:

a) The wealthy farm owner

Little information was gathered about this group. Because most of the interest in this research evolves around poor local grassroots, individuals from this group were not directly interviewed. The description provided on the group mainly comes from field observations and informal conversation with several individuals from the area. Farmers from this group usually reside in urban centres and run a business in San Carlos. Normally they rely on paid labour for the management of their farms which tend to be larger than 140 hectares (SI-FEC; 1996). This group usually owns cattle, boats and water pumps, and these individuals are rarely or never involved in community reforestation activities.

b) The less poor farm owner

Has access to the land by either presidential decree and possesses a title or, in a very few cases, by inheritance. The area owned tends to be in the 24 to 70 hectares range (ibid.) Their land is usually located alongside riverbeds or other water sources. His/her

main activity is either cattle raising or cash crop production which is sold in the local market or near-by towns in Costa Rica (town of Los Chiles). Part of the cash generated is utilised in the purchase of improved seeds and household goods (salt, sugar, oil, gas, etc.) He/she usually participates in development programs for the improvement of their farms and/or economic activity. Indicators of wealth among this group of farmers include:

- number of cattle owned, usually between two to 20 head;
- number of chickens and pigs;
- houses with zinc roofs and wooden walls; and
- in some cases presence of barbed-wire fences.

A total of eleven interviews were performed in this group, eight of the interviewees live along the Sabalos watershed where the Alcaldia reforestation project activities were concentrated.

c) The poor farm owner

Owns up to 35 hectares (50Mz) (ibid.) and also has legal access to the land by presidential decree in either a form of a title (usually non-legally registered) or by a possession right. The geographic location of their land is often at a considerable distance from the river. This group relies on a subsistence economy with his/her land dedicated to the production of basic staples such as rice, beans and maize as well as ground provisions (malanga, cassava). To obtain cash for household goods they:

- sell surplus production of one of the staples harvested;
- the men sell their labour to a wealthier farmer or
- the men travel to the Costa Rican border as seasonal labourers during peak harvesting season.

Women usually rely on patio activities such as raising a few chickens and a pig for extra income. They usually participate in any development project that would help them improve their economic situation.

In most cases the last two sub-groups of farmers are usually part of a larger geographic community. However the distances between farms as well as their distance to the core of the community give a different impression. This socio-geographic constraint has a direct impact in the development and implementation of any project requiring a communal input or action. A summary on the number of individuals interviewed in the last two categories is given below:

No of interviews by Sub-category	Geographic Location by Watershed	
	Sabalos	Santa Cruz
Less poor	8	3
Poor	2	1
Total	10	4

(ii) Communities

In the study area the term community applies to the concentration of 20 to 30 individual houses in a cluster. To date, national censuses and the official land register office have not been able to specifically determine the unit area occupied by these groups in the Municipality of El Castillo. Nevertheless, it was observed during the fieldwork that distance between houses usually varies from three to ten meters.

The communities visited during the fieldwork are relatively new and principally located in the borders of the Indio-Maiz reserve. Their political and religious make-up is diverse, and in some instances escalates into violence. Most communities elect a committee whose main responsibilities include:

- The maintenance of near by roads and bridges;
- Conflict resolution between community members; and
- Utterance of community's concerns to state authorities and others.

The interview results, however, demonstrate a high level of dissatisfaction among community members about the role of their committee. In the opinion of most interviewees, "the committee is usually inoperative and nearly all members are good friends".

The economic activities among community members are diverse, these include harvesting and selling of non-timber forest products, selling of eggs and chicks, raising of a piglet to be sold later, growing and harvesting of subsistence crops on either rented land or communal areas. Individuals from this group usually participate in development projects to improve the living conditions in their communities and occasionally to improve their economic conditions.

(iii) Settlers

The most disadvantaged social, political and economic groups are usually found inside the Indio-Maiz reserve, on other marginal lands and in river buffer zones. The typical settlers are individuals that have come from other parts of the country in search of land, better soils and access to natural resources. Their migration to the area occurred after legal parcelling of land during the peace process carried out by INRA.

An example of this situation is the case between the Union de Cooperativas Palmera-UCOPA (Palm Co-operative) and settlers in the community of El Vivero. In the early 1990s, 22 families established inside a buffer zone designated for water bodies after the land they once lived and worked, not necessarily owned, was claimed by the Chamorro's oil processing company during the presidential period of Violeta Chamorro. The group settled in 400 meters by 50 meters area, along the Santa Cruz River on land owned by the Union de Cooperativas Palmera-UCOPA (Palm Co-operative). This situation has been the source of irreconcilable differences evolving into conflict between the community and neighbouring members of UCOPA. On the one hand interviewed settlers (focus group) from El Vivero claimed that a female leader from UCOPA causes most of their problems. Settlers believe that "because she is in charge of payroll bosses member of the co-operative, provokes quarrels and boycotts meeting between us (the community), UCOPA and the Alcaldia, making our life difficult". While on the other hand, key informants and a focus group participant expressed that putting personal differences aside, "UCOPA is responsible for protecting that particular section of the watershed within their private jurisdiction. They have the right to make any claims over that section of land and enjoy the support of the Alcaldia and local environmental NGOs".

Economic activities among settlers group are rather irregular worsening poverty levels some activities might involve baking, embroidery, selling and hatching of poultry eggs. Although there is an eminent need to improve settlers' livelihood, without a secure land base selected NGOs and local government representations have chosen to neglect these communities and not include them in project activities.

Local Government

By official decree, municipalities in Nicaragua have been granted the role to administer and manage the natural resources under their jurisdiction. In theory, the local government is also responsible for the improvement of sanitary conditions in the communities as well as the protection of the surrounding environment with emphasis in potable water sources and waste disposal (Placer Dome de Nicaragua; Undated).

The majority of interviewees from the communities however perceive the principal role of the local government has been mainly tax collection and in some instances conflict mediator. Government contacts with communities are made sporadically, unless there are forthcoming municipal elections. The support given by the central government to promote government presence in local communities is very little which re-inforces perceptions of government as tax collector rather than service provider. The liberal government in power in the late 1990s also chooses to bypass local authority in order to maintain close control at this local level. According to a key informant, if the elected co-ordinator of the municipal committee is not a liberal, the central government appoints an assistant mayor who is immediately given political and administrative powers. Presently, the role and power exerted by the local government over local natural resources has been minimised to superficial stewardship.

Central Government Representations

These are mainly represented in the field of health, education, home affairs and natural resources. Natural resources represent the most substantial area of involvement by the central government. Primary natural resource endowments under the central

government include the Indio-Maiz reserve, the development of a wildlife corridor, eco-tourism activities, the exploitation of forest products, and the construction of a dry canal.

(i) **The Ministerio de Recursos Naturales y del Ambiente (MARENA)**

MARENA (the Ministry of Natural Resources and the Environment) is the first agent for the central government. MARENA is the legal steward of all natural resource endowments in the area and its activities include environmental education, forest extension, river patrolling (to ensure buffer zones are respected), and reforestation of riverbeds, wardens of the Indio-Maiz reserve, control of precious woods and wildlife illegal poaching.

(ii) **The Instituto Nacional de Reforma Agraria (INRA)**

INRA (National Institute of Agrarian Reform) is not directly involved in the management of natural resources but it does play an important indirect role in this area. INRA is responsible for the legal parcelling of lands allocated including buffer zones. Their input into the land tenure process has on occasion been a source of conflict among actors.

Local Non-Governmental Organisations (NGOs)

Nicaraguan NGOs during the Sandinista era (late 1970s to the late 1980s) evolved in the form of socialist inspired movements (Kothari; 1996:158), such as peasant and women movements. During the late 1980s, the Sandinista government lost elections and the on-going peace process resulted in the massive occupation of San Juan River Department. At the same time the world-wide discourse on sustainable development

created the conditions for the emergence of Grassroots Support Organisations-GRSO in El Castillo.

Bryant and Bailey's (1997) definition of GRSO accurately fits the characteristics of existing GRSO in El Castillo. They define GRSOs as "organisations often established by teams of highly skilled professionals, such as scientists, economists, agronomists or ecologists" (Bryant & Bailey; 1997:136), however in this particular case, local politicians are also involved. The intent of GRSOs "is either to help support community-based movements in the promotion of environmentally sustainable projects by themselves to initiate such projects in areas threatened by ecological destruction from local economic practices". In El Castillo, it is normally the former. Bryant and Bailey conclude their definitions by noting 'many of these organisations are non-membership based, and are staffed by educated non-community members' (ibid). In fact, the membership issue is a matter of discontent expressed by communities, who claim it has an impact in their response to development projects and their success.

There are number of GRSO operating in the Municipality of El Castillo, however only two of them were mentioned by all interviewees.

(i) Fundación del Río (FdR)

FdR supports reforestation activities with farmers, environmental education in rural schools and provides cash credits to farmers for the purchase of cattle and the production and commercialisation of single crops, such as annato²⁹ (*Bixa orellana*) [Heywood; 1993], destined to local and regional markets. FdR cash credits to farmers are

²⁹ Mainly used as a spice for cooking

given on the condition they leave with the organisation a valuable item in guarantee for the amount of cash borrowed. Such item usually refers to the farmer's title deed of his/her property; some farmers are sceptical to this mechanism preferring to opt out the opportunity. In the case of loans for cattle the farmers have the option to pay back FdR with a young calf. The principal financial supporter of FdR activities is the Danish Development Agency (DANIDA).

(ii) The Centro de Investigacion y Promocion para el Desarrollo Rural y Social (CIPRES)

CIPRES (Research Centre for the Promotion of Social and Rural Development) with headquarters in Managua (Nicaragua's capital), specialises in social rural issues. Like all GRSO, CIPRES' activities comply with the economic activities outlined for the socio-economic development of the Indio-Maiz buffer zone. Since 1992, CIPRES activities in the Municipality have been geared to the integral development of the area. However, neither their project development activities in the area are systematic, nor the relevant information about their activities in the zone systematised (Pasquier, 1999; personal communication). CIPRES integral development projects are developed under the supervision of a formally trained technician assigned to specific communities and local promoters, who are community members hired by the organisation. Communities favoured by CIPRES activities in the area are El Castillo, San Ramon, Goyo Boca, Gordiano, Buena Vista, Marcelo and Laureano Mairena, where the majority of farmers seem to fall under the less poor subcategory.

CIPRES supports farming activities and to a lesser extent reforestation activities.

Support to farming activities is done through a revolving loan fund, which refers to an amount of financial resources lent with increased returns depending on the interest rate established. The revolving loan fund provides cash or seed credits that are procured by a rural credit committee established within the community, which is also responsible for establishing interest rates on the loans. Presently, only the communities of San Ramon, El Gordiano and Buena Vista have a credit committee.

The committee's functions include the implementation of credit policies based on regulations elaborated by peasants, the selection of credit beneficiaries and ensuring the devolution of the loan by farmers. Loans can be paid back with harvested crops that are later sold by CIPRES.

The objective of the revolving loan fund is to promote the production and commercialisation of value added crops (ginger, beans, and malanga) among peasant farmers, with the long-term goal of transfer of funds ownership to its beneficiaries. Seed funds to initiate this rummage fund were partially donated by international NGOs (CIPRES; Undated). CIPRES also plays the role of entrepreneur in the area buying its beneficiaries' harvest for their eventual commercialisation. The opinions of poor farmers interviewed about the fund are not entirely positive. Interviews from El Gordiano 1&2 summed up their impressions about CIPRES with:

"These credits don't help us in anything but to get us into more debts. The bean seeds they gave us were not good, the weather didn't help either and now we have to pay them back."

Another type of activity supported by CIPRES is the organisation of women's groups in income generating activities, which are usually referred to as "actividades de patio" (patio's activities). These income generating activities involve the establishment of home gardens, raising of minor livestock (pigs and chickens) and baking, CIPRES provide the group with seeds, young animals and construction material for ovens. The groups' activities are approved by a gender-balanced committee and administered by a rural promoter who is a community member hired by CIPRES. Women's income needs are expressed by the leaders of the group to the promoter and to the committee for approval. Once the activity is approved, the promoters are responsible for supplying the necessary inputs. This approach for allocating support has led to conflicts among women's participants. These conflicts usually stem from the committee's and promoter's power over the inputs and female interviewees from two different communities complained about promoter's favouritism with family members and friends.

The reforestation activities supported by CIPRES involve the distribution of seeds and nursery materials. Women are occasionally hired for the establishment of tree nurseries and paid \$0.60 Córdoba per plant produced after the technician inspects it. According to an interviewee from CIPRES, "before reforestation seeds are distributed communities are invited to attend meetings and workshops about types of seed that will be provided, planting and nursery techniques". While some interviewees confirmed CIPRES actions others denied it arguing that "CIPRES give us the seeds and doesn't tell us what they are for, they also promised vegetable seeds and never brought them". Field observations lead to the conclusion of a perceived sense of project failures and disorganisation among the CIPRES women's project.

As evidence shows it is hard to specify the field of actions of these two GRSOs in El Castillo. They both seem to be working in similar activities using the same approach and in some cases even with the same individuals. At least 50 percent of the farmers interviewed have been involved or are involved with both organisations. The situation of GRSO's mixed field of actions and objectives in El Castillo could be a result of central government measures to stop the advancement of the agricultural frontier. As explained in section 3.1.1. the use of land surrounding the reserve was restricted to activities targeting sustainable use of natural resources, low input agriculture and biodiversity conservation.

International Non-Governmental Organisations (INGOs)

The fields of action for INGOs in El Castillo are mainly related to improving human health and the environment. Organisations such as Medicos del Mundo (MM) interact directly with the communities on an on-going basis. This is not typical as most INGOs restrict their activities to occasional visits from international head offices and/or regional representations. INGOs often rely on local NGOs to disburse their funds in the development and implementation of projects.

Business

Business refers to family business and local corporations in El Castillo which are politically influential. The history of business in El Castillo is similar to business operations in many parts of the third world and is often based on close ties with government officials and family connections. This privileged status facilitates the use

and exploitation of natural resources, without being accountable for negative or positive impacts they caused. The central government is often part of the conflict between business and local communities. In its role as regulator of the commons the central government has created a number of policies which restrict the use of the resources within the reserve to landless peasants. The central government also grants concessions to logging companies and individuals to supply Plywood Corporation which has a long history of logging activities in the area. Plywood was officially constituted in 1957, becoming the leader in the 1970s of exports in Central America. In the early 1980s was nationalised and renamed COREXSA (Corfop Extracciones, S.A.). In 1995 was returned to its original owners (Mairena; 1999b) and named again Plywood Corporation.

International Funding Institutions (IFI)

Two different kinds of IFI were identified in El Castillo, The Danish International Development Agency (DANIDA) and The Global Environmental Facility (GEF). Although they fall in the same category the role-played by these organisation is fairly different.

(i) The Danish International Development Agency (DANIDA)

DANIDA assistance mainly aims at the sustainable use of the area and most of the activities funded are basically geared towards damage control caused by the economic activities of peasants living near the Indio-Maiz reserve (DANIDA; undated). They have representation in Boca de Sabalos that also hosts local government units and the local NGO, Fundacion del Rio. The financial support of DANIDA in the development and implementation of projects is channelled through the Alcaldia Project Unit and the local

NGO Fundacion del Rio. The communities had very positive views of DANIDA role in the local area which is in contrast to the opinions received about its business partners.

(ii) **Global Environmental Facility (GEF)**

The other IFI in the area is the World Bank funded Global Environmental Facility (GEF) and is literally unknown to the communities and farmers residing in the area.

According to its mandate, the GEF is promoting the establishment of a biological corridor embracing the Indio-Maiz buffer zone (GEF; 1997). Claims made by the local newspaper “El Nuevo Diario” (Mairena; 1999a) in an interview with the project co-ordinator, suggest the use of a top-down approach and lack of public consultation in the implementation and development of this project. Besides the main beneficiaries will be businesses directly involved with tourism development in the area.

Other Actors

Although it might seem irrelevant, there are two types of actors in this group that play a role in the use and conflict over the natural resources in the area. The first type refers to illegal migrants from Nicaragua crossing the Costa Rican border, who in several occasions were pointed as the culprit of crop destruction in farms located on the border. The second type refers to poachers from Costa Rica who are over-fishing river shrimp, hunting wildlife in the reserve and are involved in the illegal traffic of protected forest species like mahogany. In the first case there is little action since there isn't a regulatory body for crop-protection or illegal migration in location. In the second case is MARENA's role, which in such cases excise the item. However, in most cases they are usually helpless due to the lack of capital equipment to perform their duties.

4.2 Conflict and Development

What is conflict? Conflict is based on individuals' reaction to an issue where their interests are opposed, and it emerges as a result of these individuals' (in this case stakeholders) disagreement and lack of consensus over a problem. In natural resource use and management for example, one frequent conflictual issue evolves around restrictions over the use of the commons. Daniels and Walker's argument cited in Ramírez (1999:115) offers a new perspective in how community development coupled with natural resources management can benefit from conflict. They argue that "although conflict is unavoidable in natural resources management it can be a source of innovation from which progress often emerges". This perspective implies that conflict could have the potential to build community through collaborative negotiation and a consensus-building process. Through these processes stakeholders are able to interact together over a single problem and possible solutions, by expressing and discussing their different views, thus strengthening their negotiation and participation skills (Ramírez: 1999).

4.2.1 What constitutes conflict in this study?

In the Municipality of El Castillo, interview results show that the wide variety of stakeholders and their agendas over land, water, forest resources and even people are a great source of conflicts. Most interestingly, conflicts not only cross the boundaries between stakeholders but also occur to a significant extent within the same group of stakeholders with different interest over the same resource. Consequently the variety of conflicts identified and their magnitude, are as varied as the number and type of stakeholders in the area. In the context of this study conflicts were identified from a tri-

dimensional perspective: the individual or stakeholder involved, the issue causing the problem and the scope of the problem (ibid.).

Discussions and description of individuals or stakeholders involved in the conflict is presented in section 4.1.3 and summarised in table 3. Issues causing conflict are varied and include; natural resource use and management; social and cultural responses; political orientations; and further discussions on sources of conflict follow in section 4.2.2.

For the purpose of this research the scope and magnitude of the conflict is firstly divided into non-violent and violent conflict, and then disaggregated further as outlined in the following paragraphs.

Non-violent conflicts

These types of conflicts are characterised by an absence of violence, but can occur within or between stakeholders and consist of:

- Tensions and disputes within households or the community. A few examples include disputes over ownership of land, misuse of natural resources, and conflicts of interest.**
- Tensions and disputes between households and institutions. A few examples include tensions caused by existing policies and legislation around natural resources, political orientation and lack of trust in project development.**
- Institutional rivalry. Tension in this category occurs within and amongst local NGOs, local government and central government representations. Competition for project funds is often the main cause of institutional rivalry but debates over strategic directions can also spark inter-institutional tensions.**

Violent conflicts

These types of conflicts are characterised by the presence of open violence, which usually occurs amongst individuals at the grassroots level and within households. They consist of:

- **Physical and sexual assault.** This type of conflict is mainly driven by male's consumption of alcohol. A few examples include rape and verbal abuse towards female individuals.
- **Death.** In this category conflict often evolves around political differences. An example of this includes death caused by individuals who are against community organisation.

4.2.2 Sources of conflict

According to field results and socio-economic studies of the area reviewed (Alguera et al, 1994; Mejia et al, 1995) most grassroots stakeholders are relatively new in the area, thus the sense of community amongst them has not fully developed. As a result negotiation and conflict resolution skills within this set of stakeholders are still very weak, sporadically escalating into open violence. Added to this are their lack of organisational skills and knowledge of the tropical ecosystem that affect the development and success of activities to improve their community. Ninety percent of individuals interviewed come from dry tropical ecosystems bringing with them a culture of land use

that conflicts with the ecology of the area, disrupting the use of indigenous knowledge³⁰ practices. For instance some of the interviewed farmers, whose main activity is cattle raising, refuse to participate in reforestation activities to improve the watershed. Their argument is “my cattle come first” or “I know how to farm better because I come from an area where we know how to do it”.

Conclusively, natural resource use and management in El Castillo is the basis for conflict at the social, economic and cultural level among individuals and between individuals and the physical environment. Conflicts were identified through the elaboration of a conflict matrix comparing actors against each other and other actors (See page 100 & 101). The findings of the matrix are based on interviewees’ perceptions that were sorted and re-grouped into dominant issues. These issues were later ranked based on the frequency of appearance in the total number of interviews (See Table below).

³⁰ “Indigenous knowledge usually reflects a detailed appreciation and understanding of local environmental resources by grassroots actors, and that such knowledge has often served as the basis for highly effective environmental management systems allowing for simultaneous resources exploitations and conservation.” (Bryant & Bailey; 1997:161)

Table 7: Ranking of Conflict Sources

Issues Identified	Frequency (# of times)
Natural Resources	48
• Cattle	13
• Overuse/misuse of natural resources	11
• People	8
• Land disputes	8
• Vulnerability ³¹	8
Social/Cultural	16
• Personality	9
• Gender	5
• Conflict of Interest ³²	3
Political Orientations	5

The results of this procedure demonstrate that the highest ranked conflict evolves around the use and management of natural resources and policies in place. The second and third most important source of conflict evolves around social, cultural and political issues. The results presented in the reminder of this chapter reflect community perceptions as expressed by the different actors in the study area.

³¹ Communities surrounding the reserve are prone to tropical diseases and wild life attacks, and communities living in riverine buffer zones are prone to inundation.

³² Refers to conflict caused by favouritism to either family ties or friendship in project development.

Natural Resource use and management issues

(i) Cattle

The most common source of tension at the grassroots level involves quarrels between neighbours caused by free roaming and trespassing of cattle onto reforested or garden areas. Within households, free roaming of cattle is also a problem, particularly in households whose main activity is the raising of livestock. For this reason, communities living near cattle farms and individuals whose main economic activity relies in the raising of cattle³³ are reluctant to participate in any reforestation project.

ii) Overuse/misuse of natural resources

The second greatest source of tension is related to neighbours and passers-by misusing natural resources, either over the commons or within their properties. Some of the problems expressed were:

- Deforestation of river beds;
- Over-fishing;
- Illegal activities such as hunting of wild life and illegal logging;
- Logging of protected species by the legal owner;
- Garbage and human waste disposal in and around water sources;
- Forest fires caused by the burning of weeds in the preparation of land for agriculture;
- and
- Restricted access to sources of potable water located on land owned by a single individual, to other members within the same geographical community.

³³ The average number of cattle in these farms is between 30 to 50 head.

Tensions between grassroots and central government representation evolve around policies and legislation governing the use and ownership of the resources. The most common problems at this level are between settlers and MARENA regarding the occupation of land and tree felling within the reserve. There is also tension between MARENA and farmers around deforestation policies in mountainous areas. Problems were also identified between grassroots, business, local government and NGOs about the use and occupation of buffer zone areas that are legally designated for water bodies.

iii) Land disputes

Land tenure is another source of tension that sporadically occurs between communities and farmers with settlers. There were two cases where another person is claiming the ownership of land that has been occupied for some time by the same individual. For individuals that participated in reforestation activities, land was not an issue, since they are rightful owners of their lands. However, most of these farms have not legally registered their properties, either to evade government taxes or because they are too poor to pay.

iv) Vulnerability

Besides the impact of social conflicts, communities located around the Indio-Maiz reserve are vulnerable to serious illnesses that have a direct impact in their overall health. In the community of Bartola alone 400 cases of Leshmaniasis were reported in 1998 (Malespin, 1999; personal communication). Communities and settlers are also vulnerable to changes in local climate patterns. Interviewees complained about the disastrous impact on their crop yield of either extreme drought or heavy rains during the last three

years. To some settlers living in river buffer zones heavy rains have either washed away their homes or damaged the poor infrastructure of their houses.

Social and cultural response issues

These types of issues seem to add the biggest burden on community organisation and project development in El Castillo. This is evidently a result of the political and economic history, as well as the presence of bountiful natural endowments and the region's geographic location.

At the grassroots level tensions specifically evolve around personality, gender, favouritism in project development and an individual's political orientation.

i) Personality

Personality differences and slander have been the culprit in the failure of projects and of community and women organisations.

ii) Gender

Gender factors also affect the individual responses to community organisation and project development. This is usually to the disadvantage of women in the household, where in some cases conflict arises if she wants to participate in women's groups. Traditional perceptions around gender roles can also represent a barrier, for example in one community a group of single women were stopped from participating in a youth environmental community organisation by their parents, because it wasn't thought right for them to mingle with men's groups.

Open violence against women caused by consumption of alcohol by male individuals also occurs within this issue. Female interviewees complained about the

vulnerability of young girls and women to verbal abuse, physical and sexual assaults by drunken male individuals.

iii) Conflicts of interest

Conflicts of interest have been another factor aggravating conflict within the community and between individuals in project development activities. A community member representing a local NGO tends to favour his/her relatives and friends in the implementation of projects. This leaves his/her family with greater benefits than the rest of the community.

Political orientation issues

The impact of the war in the area is still palpable. Some communities in the area are still struggling over their political differences, and some are just getting over it, claiming this is “thanks to religious influences”. Undoubtedly, this situation affects the degree of commitment and response to community organisation and development. In one of the communities visited, we were informed about open violence against community members in the past. According to three informants from one of the communities visited, there were death threats received by the community from ex-members of anti-Sandinista groups, who were against community organisation.

In the opinion of the informants, there is also tension between grassroots and local government due to political orientation and/or representation of the local government in power. There is a general climate of discontent in the way the local government carries on with its duties. Some people felt that they only visit the communities and offer assistance when seeking for votes, as Municipal elections approach. This climate of

community discontent was also found around their relationship with technicians from central government representation and local NGOs. Most of the informants from the communities felt that some technicians come to their communities simply to meet deadlines. When implementing projects they come often at the beginning and either do not come back or come back sporadically once they achieved the organisation's goal. This has obviously undermined the level of trust and confidence that the community will have for the organisation. Some communities said that they are tired of people coming and offering things: "they come once and never come back again". Others felt that these organisations come to the communities offering projects, but the real beneficiary is the technician: "they come, leave me with a few trees, and he/she is left with a nice house in the city."

The results also show the presence of institutional rivalry within and among local institutions and central government representatives. Tension within organisations is frequently caused by personal differences. However, when it comes to tensions between organisations, it is usually about lack of effective communication, personal differences, power over the resources, competition for funds and political orientation. Eventually this reflects in the way projects are carried out and perceived by the communities and the level of impact at their organisational and livelihood improvement level.

One of the purposes of this research was to look at the possibilities of applying co-management approaches to natural resources in El Castillo. Project's documents (MAG/INRA/IRENA, 1991; CTFS, 1994; GoN & MARENA, 1995; CGEA, 1996) reviewed reveal the several attempts made for the implementation of participatory and collaborative approaches in the study area.

In September 1994, an assessment study made by the Comision Tecnica Forestal del Sureste de Nicaragua (Technical Forestry Commission) based in MARENA revealed the central government inability to manage natural resources and address poverty in areas within the SI-A-PAZ framework. Based on the assessment's results the Commission proposed the introduction of participatory approaches to the management of forest resources. In response to the Commission's proposed approaches, the Government of Nicaragua (GoN) and MARENA created the south-eastern superintendent's office in late 1994 (see section 3.1.1). Through the superintendent's office, the government attempted to decentralise the management of natural resources and give a participatory spin by officially proclaiming co-operation between local people and state authorities under SI-A-PAZ framework. In theory the local government delegated some authority and decision-making power over resource management and development to local government. However, field results supported by CEGEA's (1996) findings demonstrate that neither approach proposed seems to have been successful to date.

The situation of natural resource management in El Castillo complies with the first mandatory condition³⁴ in the implementation of co-management approaches. However, when we look at the level of community organisation and degree of conflicts within communities, as well as the level of mistrust and dissatisfaction among the different actors, it would be rather unrealistic to propose such an approach. Although there are structures and policies that have long been in place the local reality tells differently. The central government's lack of support and by-passing of existing natural

³⁴ Dissatisfaction with a present system or conflict over a resource (Jentoft and McCay; 1996).

resource management policies could be interpreted as their unwillingness to take part in a co-management arrangement, where it plays a key role. Decisions and real powers over the resource are still highly centralised and an essential part in the economic agenda of the governing party.

To conclude, the table below derived from the conflict matrix presented in page 66, summarises the main types of conflicts and their sources found in this study.

Table 8: Types of Conflicts and sources identified in the field

Actors	GR	LG	CG	LNGOs	INGOs	BS	IFI	O
Grassroots (GR)	<ul style="list-style-type: none"> - free roaming of livestock - slander - land disputes - alcohol consumption by males - lack of motivation/ organisation to participate in project/ communal activities - favouritism - male partners' jealousy - conflict of interest in project development - fear of being killed - natural resources misuse/ overuse - fires caused during land preparation 							
Local government (LG)	<ul style="list-style-type: none"> - women are jealous of female technicians - lack of control in alcohol consumption - lack of trust - open violence against technicians 	<ul style="list-style-type: none"> - personality differences - professional irresponsibility (sporadic visits to project sites) 						
Central government (CG)	<ul style="list-style-type: none"> - new settlements within the reserve - existing policies over natural resource use - lack of trust - illegal logging & poaching of wildlife - bribery - irresponsible technicians - weak enforcement of regulations 	<ul style="list-style-type: none"> - lack of substantial support. CG is mainly present in planning meetings 	N/A (not available)					

Actors	GR	LG	CG	LNGOs	INGOs	BS	IFI	O
Local NGOs (LN)	<ul style="list-style-type: none"> - lack of trust - lack of accountability - irresponsible technicians - undefined roles (natural resources regulator vs. community development advocate) - credits provided further in debt 'beneficiaries' 	<ul style="list-style-type: none"> - different ways to approach communities 	<ul style="list-style-type: none"> - different agendas over management and use of the resources, and ways of intervention 	<ul style="list-style-type: none"> - Competition over project funds - different ways to approach communities 				
International NGOs (IN)	<ul style="list-style-type: none"> - some INGO members make discriminatory remarks about GR 	N/A	N/A	<ul style="list-style-type: none"> - political orientations 	N/A			
Business (BS)	<ul style="list-style-type: none"> - uncontrolled logging, hunting and fishing - take over of land occupied by settlers - environmental destruction 	N/A	N/A	<ul style="list-style-type: none"> - different agendas and approaches in natural resources use/management 	N/A	N/A		
International Funding Institutions (IFI)	<ul style="list-style-type: none"> - lack of communication - sporadic visits to project sites 	N/A	N/A	N/A		N/A	N/A	
Others (O)	<ul style="list-style-type: none"> - destruction and stealing of crops - lack of trust 	N/A	<ul style="list-style-type: none"> - illegal logging and poaching by outsiders 	N/A	N/A	N/A	N/A	N/A

4.3 The Reforestation Project

4.3.1 Community Profiles

During its implementation phase, 75 farmers directly participated in the reforestation project carried out by the Alcaldia of El Castillo, the outcome of the project aimed to indirectly benefit a total of 185 farmers living along the mid-high section of the Sabalos and Santa Cruz watersheds. All 75 farmers that participated in the first phase fall into the less poor and poor categories living in the communities of Gordiano 1&2, Guasimo and Goyo Boca located along the Sabalos watershed; and Buena Vista, Diamante, Caño Padilla, Monico and Las Maravillas located along the Santa Cruz watershed. Only the communities of Gordiano, Guasimo, Buena Vista and El Monico were visited during the fieldwork for this thesis, first hand knowledge for the community of Goyo Boca, however was obtained during our stay in Guasimo.

Before a brief profile of each community is given, it is necessary to give a general profile of Boca de Sabalos as the geographic reference to all communities visited. Boca de Sabalos is the principal city of the Municipality of El Castillo and one of the two existing urban centres. With 915 inhabitants (MINSA; 1999), the city is located in the intersection of San Juan and Sabalos Rivers and is accessible by water and a seasonal road (summer only). From a socio-economic standpoint, Sabalos represents the main commercial and public services gathering point for the provision of business and government services.

Santa Cruz Watershed

(i) Buena Vista

This community emerged in the 1980s during the Ipecac roots boom. The community is located along the Santa Cruz River and considered semi-urban due to its accessibility and relatively developed infrastructure. Most houses are made of wooden walls and zinc roofs with latrines and access to well water, as well as a generator that provides the community with two to three hours of electricity in the evening. Buena Vista with a population of approximately 1020 inhabitants (ibid.) is the second most important community in the area, at three hours by road from Boca de Sabalos it serves as the convergence point from the rest of communities located along the Sabalos River. The main economic activity is crop production and commercialisation and to a lesser extent cattle raising mostly for milk (Alguera et. Al, 1994; Ortega-Alarie, 2000).

(ii) El Monico

With an estimated population of 455 inhabitants (ibid.) it is located along the creek by the same name, which is one of the greatest tributaries of the Santa Cruz River. Monico is at two hours driving distance (in the summer) from Boca de Sabalos. In 1995, 80 percent of El Monico's population had been living in the area less than five years explaining the existing infrastructure. Farms are mostly 35 hectares of which 1.4 hectares to 3.5 hectares are used for agriculture and the remaining are either felled for cattle raising or timber extraction. The main crops produced by percentage of total land area owned are maize (24%), rice (20%), cassava (30%), beans (16%), plantain (12%) and malanga (4%) (Grijalba et. al.; 1995).

*Sabalos Watershed***(i) Gordiano 1&2**

With an estimated population of 525 inhabitants, it is located along the Sabalos River at two hours walk (in summer time) from Buena Vista. Approximately half the population falls under the poor farmer category living in small rustic ranches with no access to basic services, most houses do not have latrines and draw drinking water directly from the river or nearby creeks. The main economic activities are the production of crops (beans, maize, coffee), ground provisions (cassava and malanga), fruits (bananas and plantain) and rising of small livestock (chickens and pigs).

(ii) Guasimo

With an estimated population of 995 inhabitants, it is located along the Sabalos River at four walking (only) hours from Buena Vista. This community contains cases of extreme poverty lacking basic services, house do not have latrines and human waste is normally disposed of along river beads and nearby creeks, where drinking water is also obtained from. This community was deeply affected by the war, showing until not long ago, severe violence resulting in ten deaths the previous year. At the time of the fieldwork, however differences among individuals with political orientations seemed to have settled down. Two interviews from the community believe this situation has changed due to religious influences from four different churches shared between Catholics and Evangelist streams, established in the community. The main economic activities in the community are the production of maize, beans, cassava and malanga as well as the rising of minor livestock (chicken and pigs).

(iii) Goyo Boca

According to the interviewee from this sector and a key informant, houses in this sector are along the river bed very dispersed usually requiring a two hour walk between farms. My perception from this interview was that most individuals fall into the less poor farmer category who dedicate to the production and small scale commercialisation of crops, mainly rice and beans. In spite of the relative wealth of its inhabitants this sector also lacks access to basic services.

4.3.2 Active community participation or receptive communities over project implementation?

As previously mentioned (See chapter 3), a majority of community members living in El Castillo are not originally from this area. According to studies done by the Centre for the Investigation and Promotion of Rural Development – CIPRES (Prado, 1991; Cardenal & Pasquier, 1995), from the 1950s the local peasant population in this region included a substantial number of in-migrants from drier agro-ecological zones. As a result their understanding of farming (livestock and staple crops) and its interaction with humid tropic ecosystems is very limited.

The sense of the current level of community participation captured among the interviewees does not seem to be strong. There seems to be general apathy to community meetings and activities. In some cases, this behaviour is a response to their mistrust of government programs and/or activities such as farming and reforestation with some

NGOs. In other cases, the head of the household, or the men, or even the whole family occasionally go to Costa Rica as peasant labour to earn income and therefore is absent from the community for lengthy periods of time.

Most of the reforestation programs that have been carried out in many of these communities have been done with individual farmers and not with the whole community. There were various reasons identified. One reason for example, is that the first phase of the reforestation project funded by the Alcaldia targeted only farmers living along the riverbeds situated in the mid-high section of the watershed. The Alcaldia had limited funding and therefore was forced to select and work with a few individuals rather than the community as a whole. Another reason is that only a few farmers were willing to participate, others considered this activity a 'waste of time', since it did not fit their on-going activities.

In my observations, a standard operating procedure among NGOs working strategy appeared to be based on individual farmer's criteria and not communities. For example the local NGO Fundacion del Rio, who provides farmers with credits, implemented a reforestation program that only included farmers working within their programs.

There are many organisations working with the same individuals and communities, most of them visit the communities to offer projects. Typically, the farmer is told what to do and how to do it. The net effect of this absence of a participatory dynamic between the organisations and the farmers has been to discourage farmers from being pro active in the management of their natural resources. In the case of reforestation projects, the organisation approaches the individual through a rural extension worker,

who provides a brief introduction about the organisation and explains the project's objectives. In most cases the concepts used by the extension worker are not up to the academic level of the individual he/she had just approached. Nevertheless, the "campesino" is offered some basic training and tools to carry on with the activity planned.

On a regular basis the promised tools and in some cases goods were not delivered. Understandably, the campesinos expressed frustration with the missed opportunity to receive material benefit from the activity. The lost opportunity to improve the few forest resources left in the area was not expressed regularly as part of the frustration, suggesting environmental education programs are desperately needed in this area.

Some interviewees were more than willing to continue with reforestation activities. Some even suggested that the ideal would be to work with the whole community or all the farm owners (parceleros) to improve or save the watersheds.

4.3.3 Choice of Species - Who decides in the end?

Peasants seldom are involved in the choice of species for reforestation. Most of the organisations come with a pre-established set of seeds for the "campesino to plant".

Most of the species offered were semi-tropical crops, semi-dry tropical widely used in agro-silvo-pastoral systems (fire wood, nitrogen fixing, fences and food for livestock), tropical semi-precious and precious woods and semi-tropical commercial woods. Most of the campesinos (males) expressed their wish to plant species such as pine, which are good for construction but disliked by livestock. They would also like to plant fast growing Leguminosae species for fences and firewood. The campesinas

(females) choice was more oriented toward food production species such as avocados, mangoes, cocoa and coffee. The following table summarises the type of tree species most frequently used and species desired by most interviewees.

Table 9: Tree species most frequently used in reforestation activities (See list of scientific names in Annex 4)

Uses	Supplier	Alcaldia	Farmers' Choice	Farmer's Comments
Wood/construction		Cedro macho Cenizaro Pochote Guanacaste Cedro real	Cedro real Caoba Cenizaro	
Fruits/food		Mangoes Avocado Cocoa Coconuts Pineapple	Mango Zapote Guava Avocado Oranges	
Fences/posts		Madero negro	Madero negro	
Firewood		Madero negro	Madero negro Canelo	
Protection		Coconuts		
Other			Pine Eucalyptus	- because it survives and cattle don't like it - it is good for every thing and cattle doesn't like it

Only a few male and female informants had a reasonable understanding of forest resources management, and expressed a desire to plant precious wood species that are native to the area. Their argument was that these species would be used to protect water sources and provide future construction material for their children.

4.3.4 Social Equity and Participation in Reforestation Activities

The role of the community in reforestation activities

In my opinion the approaches used by the organisations in the development of projects have underestimated the dimension of community, thus decreasing their ratio of success. Such approaches have also increased the gap among community members in the organisation of their communities and the sense of project results ownership. In conclusion the role of community in reforestation activities is rather absent.

The role of the family in the management of the resources and income generating activities

The management of the resources and activities to generate income is a family affair. Whether the household is headed by a male or female the role and functions of each member of the household are clearly defined and hardly ever objected. Objection to each one's role might occur when a member of the household leaves the house to either start a new home or to seek a better future by migrating to either Costa Rica or Managua.

Farming and reforestation activities considered physically strenuous are mainly carried out by men. These activities include soil preparation and planting. The role of women in reforestation activities will usually involve help in the nursery phase, filling up of bags, occasionally, soil preparation. Women are rarely involved in the overall planning of activities, however there are isolated cases where a woman will work for her partner as a labourer in the field. Children and young adults are the main work force within the family unit. The males will help the father in the field with all farming

activities (burning of weeds, preparation of soil, planting and harvesting). These farming activities mostly refer to staple crops such as beans, maize, rice and plantain.

The decision where to plant crops or to reforest is usually made by the man in the family. If there isn't a husband, decisions are made by the oldest adult son living in the house. Men are usually in charge of cutting and carrying firewood for the household. When there is a need of cash in the house, the men look for work outside the farm, which usually involves weeding land for a wealthier farmer.

The Role of Women

The traditional woman's (usually wife, daughter and in some cases daughters in-law) role in farming and reforestation activities among these families is to take care of the male partner and children. They are in charge of cooking and serving food, washing clothes in the river, carrying drinking water, and when needed harvesting of provisions (cassava, malanga, etc.).

The main income generating activities for women take place outside the house. These activities mainly involve the raising of minor livestock such as pigs and chicken, tending orchards and gardening. The gardening activities usually evolve around the growing and caring of medicinal herbs and spices such as coriander, mint and oregano. These activities are known as "Actividades de Patio". The whole family participates during the peak of the harvest.

There were a few cases where women with male partners, were considered the head of the household. The role of the woman in this case was basically to manage the economy, and make decisions regarding household expenditures and sales of surplus

crops. These women expressed their roles as: “we are both bosses in this house” “I work side by side with him so I can say I had my share in the raising of the kids” and “he is the head and I am the body”.

The above observations and suggestions stress the need of integrated resources management which combines issues of gender equity and alternative land management and achieved development strategies into a single program.

4.3.5 Barriers Encountered

At the community level:

The main barriers encountered at this level include:

Free roaming of cattle, animals are normally left free to roam among these are pigs, which are usually very destructive in the rising of seedlings and small trees planted during reforestation activities.

Climatic variability, the year the project took place there was a severe drought in the area causing the death of planted seedlings.

Poor soils, the soils of the area are characteristic of tropical rain forest ecosystems-old and poor in nutrients.

Farmers’ scepticism, most do not believe in this type of projects. Some farmers thought that the main beneficiaries in the long run are the technicians and organisations that promote the programs.

Farmer’s knowledge; most of these people are dry land farmers moving into an agricultural frontier, as such their agricultural practices have an immediate negative impact on the ecosystems (CGEA, 1996; Medicos del Mundo, 1998).

Another barrier identified was around project implementing agencies; according to most interviewees some organisations come to the community to offer projects and never come back.

At the project level:

The main barriers encountered at this level include:

Lack of sufficient funds to promote an integrated approach for managing rural resources.

Gender dimension was not incorporated in the 1st phase of the reforestation project promoted by the Alcaldia.

It was also reported the lack of support to continue the project by the current municipal and national government.

Extreme poverty in some of the communities is also a barrier, for some individuals ensuring a living is more important than participating in a reforestation project.

Lack of co-ordination among NGOs, some implement the same type of programs with the same communities or individuals.

Irresponsible farmers; few farmers sold the seeds that were given to them to buy home made alcohol.

A major barrier at last appeared to be the existing high illiteracy rate in the communities. A majority of interviewees were unable to either recall their age or the year they were born, for instance some expressed with doubt "I think I am 40 years old but I am not really sure".

4.3.6 Perceived Impacts of Reforestation Activities at the Local Level

Short term impacts

Individuals selected to take part in the first phase funded by the Alcaldia received the tools needed to start their own nursery. A number of campesinos gained self-confidence and knowledge of their surroundings. Reforestation was a way for them to increase the value of their property. However, the perception about value over a particular tree species is based on gender. As opposed to male participants, females expressed their opinion that the planting of fruit trees around the properties is more valuable than hardwood species. In fact, one of the interviewees commented that she would be harvesting the first crop of fruits soon.

Some farmers refuse to continue with reforestation activities since they feel it is a waste of time and effort. They consider agriculture (crops and livestock) as their main activity to survive and generate income.

With regards to the environment, some individuals became conscious of the need to reforest the watersheds in order to sustain water resources in the region. However, some think that the project was a failure, as most of the planted seedlings did not survive the drought experienced in the area.

Demographic pressure and deforestation are slowly having an impact on the Indio-Maiz reserve, which is one of the most important biosphere reserve in the Americas and an integral part of the Americas Biological Corridor³⁵. Some groups have started to

³⁵ Third component of the Rural Municipalities Project. Its objective is to promote the integrity of a biological corridor along the Atlantic slopes of Nicaragua by ensuring the conservation and sustainable use of biological resources in this region (*Nicaragua, Atlantic Biological Corridor Project*; GEF, June 1997).

settle and practice farming activities into the reserve. Due to the extreme poverty and special climatic conditions of the area, the campesinos are forced to seek other resources from the forest when farming systems are not able to sustain a household. Hunting of wild life is one of their main sources of protein, usually taken from the reserve. Poaching is also a problem. On several occasions poachers from neighbouring Costa Rica have been caught taking wild life from the reserve..

According to the UNDP Report on Human Development, the incidence of poverty in Nicaragua is especially high in rural areas. 76% of the rural population are poor and 36% extremely poor, compared to 32 % and 7%, respectively; for the urban population (GEF; 1997).

In some cases reforestation projects have had a positive impact on gender relations among the individuals involved. Men are able to participate in women's activity groups such as gardening and crop planting in common areas.

Mid/long term impacts

Reforestation activities in the long run will bring economic benefits to future generations. Timber harvested from hardwood reforested areas would help satisfy and local demands for sawn logs.

Intercropping was suggested as a future alternative in the cropping system to reduce poverty. Planting a fast growing cash crop such as coffee was viewed as a means to provide some income over the short term and add value to their properties.

Some areas along the river are deforested to an extent that there is urgent need to implement and participate in more aggressive reforestation programs. Better planning,

and educational programs are needed where the outcomes and positive impact will be greater in the improvement of community livelihood and the tropical ecosystem.

Poor road conditions represent a barrier to the commercialisation of fruit species. Fruit crops could provide extra income, furthermore from a gender perspective; it will result in a more equitable distribution of income between males and females. Overall, this illustrates how an infrastructure program such as road development can positively support broader social goals such as gender equity.

CHAPTER FIVE – CONCLUSIONS

The purpose of this research was to examine the role of co-management in development generally and specifically in regions that have a legacy of social, economic and political instability. To accomplish such purposes participatory approaches to fieldwork were employed to collect qualitative and quantitative data. The fieldwork was supported by an extensive literature review about the origins and applications of co-management approaches in natural resources management.

The field research commenced by establishing contact with the Nicaraguan NGO Güises Montaña Experimental (GME) and learning about its work in the Municipality of El Castillo. Four months of fieldwork were dedicated to the collection of data, which included interviews with individuals and focus groups and gathering of relevant information about the area of study. The next phase comprised an extensive literature review and careful analysis of the information collected for the elaboration of each chapter.

Research findings and literature reviews show that natural resources use and control in developing countries still remains similar to post-colonial times and continues to play an important role in the economic agenda of powerful and non-powerful actors. Even though natural resources are part of everyone's economic agenda the purposes attached to the use of natural resources are often in conflict. Whilst the need of the state and local elite is about the accumulation of wealth, the need of the grassroot majority is about their survival and fulfilling of basic needs. In spite of their number and inherent need for the resources, grassroot groups have been stripped of many of their basic rights and given little if any power to control resource use. This has contributed to a cycle of

poverty, socio-economic and political marginalisation (a social factor associated with everyday physical changes) of the grassroot majority. The repetition of these events becomes a vicious cycle eventually resulting in land degradation and impoverishment. The effect of land degradation, which usually has a greater impact on grassroots livelihoods, eventually takes its toll in the state's authority over the use of the resource and the ecological balance of the environment, further aggravating conflict.

Many socio-economic and environmental development and protection schemes have failed to effectively address poverty in the third world. On the contrary some development programs have further increased poverty and environmental degradation. Unfortunately, in most cases they have not been able to incorporate social-cultural and political dimensions in the relationship between actors and their physical environment. Part of the question is the problem solving approach used during the planning and implementation of their activities and their overlook of local knowledge. Informed grassroots actors are conscious and fully aware of their need to relate more effectively with their environment. For instance a local peasant once expressed that "We as human beings, have to relate nature with the socio-economic, because if we deforest we will be left with nothing" (Boca de Sabalos, April 1999).

In recognition to the state's stewardship role and its incapacity to regulate their natural resources and the need of grassroot majority to access the resources, it becomes necessary to seek for a management alternative that would satisfy both's interests while making sensible use of the resources. Poverty in third world countries is worsening to the point that there is a need for an approach to gradually build up trust, negotiation skills and effective conflict resolution between the two main actors - grassroots and the state.

Within this framework falls co-management approaches as a feasible alternative to make better use of the resources through the above.

Based on these facts co-management approaches to community reforestation were proposed to examine the possibility of their implementation in the Municipality of El Castillo through a set of specific objectives (See section 1.3). Notably, fieldwork results demonstrate that community forestry cannot be fully decoupled from development in the Municipality of El Castillo considering the characteristics of the area and the key role played by natural resource use in the socio-economic development of the grassroots majority. A short review of the project's objectives as outlined in page eight follows.

Improved rural livelihood in the region

Results also show that the individuals' perception about development projects have left a sense of increasing poverty rather than livelihood improvement. These feelings are mainly caused by the lack of trust towards government authorities and local institutions.

Fostered local control of the development of local forest resources

The control of resources by grassroots organisations is a far from possible alternative due to extreme poverty and weak community organisation at the local level, management of local resources is highly centralised by the Nicaraguan government. This situation contributes to the aggravation of social and political problems at the local level that often evolves into conflict. In El Castillo marginalised groups are the most vulnerable to conflict either because of their dependency on the resource or because of

political orientation. In few occasions conflicts founded on political orientation have escalated into open violence among marginalised groups resulting in the death of at least four individuals in one community.

Changed the local rural economy

At the time of the fieldwork climatic variability and funding strategies from selected NGOs and government development programs had an impact in the rural economy. Only a few individuals expressed positively about such programs. However, this result might not only suggest failure in development project's results, but also the individual's limited knowledge about the tropical ecosystem.

Benefited gender relations

Although gender relations remain strongly traditional female individuals, particularly head of households, show a sense of empowerment and understanding of the key role played by women in the household and local economy. This attitude has been the result of the many political changes at the national and local level.

Improved the quality of the environment

Limited knowledge about tropical ecosystems, increasing poverty and accumulation of wealth by influential business and individuals continue to lead to deterioration of the quality of the environment. Protection policies enforced by MARENA and environmental oriented NGOs are constantly challenged by a needy growing rural population and lack of support from the central government.

Overall, thus research has suggested the failure, or at least very limited success, of reforestation programs in El Castillo are to a larger extent a failure of the state. The lack of institutional infrastructure coupled with a legacy of political, social and economic instabilities implies the prerequisites for a co-management program with considerable local control are not in place. Hence, the development of collaborative management for reforestation is dependant upon building effective community organisation and leadership skills, including conflict resolution at the grassroots level. Secondly, NGOs should consider reviewing their roles and methodologies used for community project development and become more involved at the local community level. This would assist with building social trust and hopefully spur the development of local institutional structures. Using their advocacy and lobbying skills they should be able to influence the nurturing of basic community development skills, and the implementation of an integrative dimension, such as human-environment, in their approaches to address poverty and local resources management. As a final point, it is important to rethink the positioning of community forestry. That is community forestry is perhaps better thought as an important contributory to development but by itself it is unreasonable to expect community forestry to be the primary catalyst of development. The role of community forestry needs to be defined within a broader development framework. Otherwise, reforestation projects will continue to be seen in a very limited context that does not bind together environment and economy or local development within a broader context of equitable economic development.

Annex 1
Location of Communities Visited in the Municipality of El Castillo

Adapted from Valerio (1999)

Annex 2
Questionnaire Used in Open-Ended Interviews
Interview Guide

1. Personal profile

Name, age, marital status, education, occupation, income, number of children, ownership of the farm/home, head of household

2. The individual's perception on community issues

- Were you born here? If not, where did you come from, when and why?
- Are you affiliated to any kind of community organisation or structure? Which one? What is your role within the organisation? How does the community benefit from it?
- Have you ever done business with other community members or neighbours? What kind of business have you been involved in?
- Are there any government policies that affect or regulate ownership of the land in this community? Do you pay any kind of taxes?
- What has been the community reaction to projects?
- What role does the local or central government play in your community?

3. The individual's perception of his/her environment

- What do you know about deforestation, logging (legal & illegal) and hunting in the area?
- Is there traffic of wildlife?
- Do you use any products (flora & fauna) from the forest? Which ones? For what?
- What does sustainable use of natural resources mean to you?
- Do you have any regulation in place to protect your natural resources? What are they?
- What is your experience dealing with environmental issues as an individual and as a member of your community? What would you do or would like to do to protect your environment?
- What do you think the short/medium/long term impact of reforestation activities will be on the environment?

The Reforestation Project

1. Project's participant as head of household

- Are you a farm owner?
- How big is your farm?
- What is your main activity in the farm/home?
- Do you enjoy your work?
- What does your partner do?
- Who manages the budget at home?
- Do you have a specific role at home/farm? How are the chores distributed? At what time does your day start?

2. General issues

- How did you find out about the reforestation project?
- What do you know about reforestation?
- What did you think about the project?
- What prompted you to participate in it?
- What were the expected outputs of the project?
- Did you take part in the decision of carrying out a reforestation project? How did the community benefit from the project?
- Were you given a choice to select your own tree species? How many and what type of species did you choose?
- Did you or any member of your family participate in the rising of seedlings? What are your plans once the trees are old enough to be harvested?

3. Second phase of reforestation activities

- Have you ever heard of Güises Montaña Experimental?
- If you were to participate in a second phase of reforestation, will the whole family be involved?
- What do you know about the actual state of the watershed where your farm is located?
- Whereabouts in the watershed of river "X" is your farm located?
- What do you think the short/medium/long term impacts of reforestation activities will be for you and the community?
- Is there any specific area you will be reforesting within the farm? If so, why?

Annex 3

Specific Questions Used with Focus Groups

- Can you read or write? If not, would you like to learn? Are you interested to learn any subject in particular?
- What are your food consumption patterns at home?
- How do you distribute your time?
- Do you have access to credits?
- What is your role in the management of the farm?
- Do you have access to income generating activities? Which ones?
- Are you or have you ever been a member of an organisation or group involved in income generating activities? Who are the influential women in the groups? How did she/they become influential? Is there a leader or an influential woman in the group?
- Have you ever been involved in any kind of forest activity? Which ones? What role did you play? Would you like to participate in reforestation activities? If yes, do you have any species in mind you would like to plant?
- In your case as head or non-head of household, who makes decisions about land use? Who decides about what, how and where to plant in the farm? Who manages the harvest?
- What do you think your role as a woman should be? Do you take part in the decision-making process at home?
- What do you and your family expect from the project? How will this contribute to your actual economic situation?
- Do you or your family have any problem with neighbours, friends or other family members?

Annex 4
Scientific Names of Species Used in Reforestation

Common Name	Scientific Name
Avocado	<i>Persea americana</i>
Caoba	<i>Swietenia spp.</i>
Canelo	<i>Cinnamomum spp.</i>
Cedro macho	<i>Carapa spp.</i>
Cedro real	<i>Cedrela odorata</i>
Cenizaro	<i>Pithecellobium saman</i>
Coconuts	<i>Cocos nucifera</i>
Eucaliptus	<i>Eucalyptus spp.</i>
Guanacaste	<i>Enterolobium spp.</i>
	<i>Albizia spp.</i>
Guava	<i>Psidium guajava</i>
Madero negro	<i>Gliricidia sepium</i>
Mangoes	<i>Mangifera indica</i>
Oranges	<i>Citrus sinensis</i>
Pine	<i>Pinus spp.</i>
Pinneapple	<i>Ananas comosus</i>
Pochote	<i>Bombacopsis quinatum</i>
Zapote	<i>Manilkara zapota</i>

Source IRENA (1992); Heywood (1993)

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