

2013-04-29

Community Perceptions of Forests, Conservation and Livelihoods in La Tigra National Park, Honduras

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Morrison, K. (2013). Community Perceptions of Forests, Conservation and Livelihoods in La Tigra National Park, Honduras (Master's thesis, University of Calgary, Calgary, Canada).

Retrieved from <https://prism.ucalgary.ca>. doi:10.11575/PRISM/25364

<http://hdl.handle.net/11023/640>

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Community Perceptions of Forests, Conservation and Livelihoods in La Tigra National
Park, Honduras

by

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A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES
IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE
DEGREE OF MASTER OF ENVIRONMENTAL DESIGN

FACULTY OF ENVIRONMENTAL DESIGN

CALGARY, ALBERTA

APRIL 2013

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Abstract

Local peoples' attitudes towards protected areas are based on local values, perceptions and experiences with management. The relationships of residents of La Tigra National Park (LTNP) to the forest, park and park management and key issues are identified and recommendations on integrating conservation and livelihood into park management are presented. Although formal conservation knowledge was relatively low, local forest and livelihood values were evident. Key issues were use of resources, land rights and livelihood restriction as well as lack of economic benefits and lack of participation in management activities. In order to better integrate conservation and livelihood needs management should increase participation, create a compensation system, facilitate a local system for resource extraction permitting, develop a community tree planting program, and increasing transparency and communication between communities and management bodies. Incorporating local values and perceptions into park management may lead to more sustainable communities and more viable protected areas.

Acknowledgements

I would like to acknowledge and thank the following people who contributed to the achievement of this thesis project:

- My supervisor, Dr. Michael Quinn, for allowing me to explore and pursue this research project on my own while providing me with integral guidance and advice throughout the entire program.
- My field assistant, Carmen Gabriela Jeffs Flores, for helping me navigate the physical and cultural terrain of Central Honduras and for her positive attitude and passion. Sin ti no habría podido lograr todo eso ni me habría divertido tanto haciéndolo.
- The Fundación AMITIGRA and employees past and present for their interest and willingness to develop and participate in the research. Gracias por todo su apoyo durante este proyecto.
- All the residents of LTNP who participated in the interviews. I feel honoured to have the privilege of your kindness, openness and honesty. Gracias por su participación, amabilidad y honestad. Me siento suerte por haber ganado su confianza.
- All my friends in La Tigra and in Honduras who have always welcomed me into their lives and made me feel at home. Gracias a todos mis amigos Hondureños por su apoyo y amistad, ahora y siempre.
- All my friends and family for their constant support and encouragement through the entire program. I wouldn't have made it without you.
- The funders who made this research possible: The Social Science and Humanities Research Council (SSRC), The International Development Research Centre (IDRC) and The Faculty of Environmental Design.

Dedication

Dedicated to my parents who taught me to stand for what I believe in and have fun doing

it.

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List of Acronyms

Acronym	Definition
AFE	<i>Administración Forestal del Estado</i> State Forest Administration
AMITIGRA	<i>Fundación Amigos de La Tigra</i> Foundation Amigos de La Tigra
CAMNP	Cerro Azul Meambar National Park
CBD	Convention on Biological Diversity
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
COCONAFOR	<i>Consejo Consultivo Nacional Forestal, Áreas Protegidas y Vida Silvestre</i> Consultative Councils for Forests, Protected Areas and Wildlife
COHDEFOR	<i>Corporación Hondureña de Desarrollo Forestal</i> Honduras Corporation of Forest Development
COLAP	<i>Consejos Locales de Áreas Protegidas</i> Local Councils for Protected Areas
DAPVS	<i>Departamento de Áreas Protegidas y Vida Silvestre</i> Department of Protected Areas and Wildlife
ICF	<i>Instituto Nacional de Conservación y Desarrollo Forestal, Áreas Protegidas y Vida Silvestre</i> National Institute for Forest Conservation and Development, Protected Areas and Wildlife
INFOP	<i>Instituto Nacional de Formación Profesional</i> National Vocational Training Institute
IUCN	International Union for Conservation of Nature
LTNP	La Tigra National Park
NGO	Non-governmental Organisation
PAR	Participatory Action Research
PRRACAGUA	<i>Programa de Reconstrucción Regional para América Central – Agua</i> Central America Regional Reconstruction Program - Water
RENARE	<i>Dirección General de Recursos Naturales Renovables</i> Department of Natural Renewable Resources
SAG	<i>Secretaría de Agricultura y Ganadería</i> Ministry of Agriculture and Livestock
SANAA	<i>Servicio Autónomo Nacional de Acueductos y Alcantarillados</i> National Autonomous Service for Aqueducts and Sewers
SERNA	<i>Secretaría de Recursos Naturales y Ambiente</i> Ministry of Natural Resources and Environment

SINAPH	<i>Sistema Nacional de Áreas Protegidas de Honduras</i> National System of Protected Areas of Honduras
SINFOR	<i>Sistema de Investigación Nacional Forestal, Áreas Protegidas y Vida Silvestre</i> National Forest, Protected Areas and Wildlife Investigation System
UNESCO	United Nations Educational, Scientific and Cultural Organization
USA	United States of America
WWF	World Wildlife Fund for Nature

Chapter One: Introduction

1.1 Introduction

Protected areas constitute a primary strategy for conservation of ecosystems throughout the world. Most protected areas are also surrounded by human populations that interact with and use the ecological goods and services provided by the park. Relationships between local people and protected areas are complex phenomena that include ecological, social and economic aspects. Local peoples' attitudes towards protected areas are based on local values, perceptions and experiences with management. Thus dissonant understandings of the forest environment between local people and conservation management can lead to conflicts between environmental protection and the needs and values of people living in the park.

The design of protected areas in Honduras is based on the biosphere reserve model where communities exist within a buffer zone of mixed land uses that surround the more strictly protected core zone. La Tigra National Park is a protected area in the highlands of Honduras that is governed by a co-management agreement between the government and a Honduran NGO, the Fundación Amigos de La Tigra (AMITIGRA). AMITIGRA is responsible for managing the park; including ecological protection and working with the communities. Due to the competing land uses and different understandings and values related to the forest and the conservation, there is often discord between local land and resource uses and AMITIGRA's conservation priorities.

This thesis explores the relationships between residents of communities within La Tigra National Park and the forests, park and park management. These relationships are explored through understanding residents' values and perceptions related to forests and conservation as well as livelihood values that may conflict with or modify expression of conservation values.

Incorporating local values and perceptions into park management may lead to more sustainable communities and more viable protected areas.

1.2 Purpose and Rationale

The purpose of my research is to further develop the understanding of the relationship between local people and protected areas and to aid the residents of the park and the Fundación Amigos de La Tigra (AMITIGRA) in the dual goals of meeting livelihood demands and conservation of natural resources within the park boundaries. To this aim I explore the current relationship of residents with the park and park management, identify key issues related to resource conservation and livelihoods in the park and develop recommendations to integrate conservation and livelihood goals. The purpose of the research is both exploratory and design-based with elements of evaluation.

The management of protected areas has traditionally considered human use and preservation as mutually exclusive activities. A more recent view of the environment as a complete system, including both human and ecological uses and values, makes it progressively more important to incorporate human interaction into conservation planning (Berkes 2004). People are often dependant on land and forest resources within protected areas for basic needs; however, these needs are not typically incorporated into protected areas management which can cause conflicts between local people and conservation bodies (Badola 1998, Bonaiuto et al. 2002, Bonta 2005, Kaimowitz and Sheil 2007, Liu et al. 2010). To ensure both the goals of conservation and livelihoods can be met, it is important to understand the relationship of local people to the protected area (de Albuquerque and de Albuquerque 2005, Allendorf 2010). With this information, managers of protected areas can better incorporate human uses, needs and

concerns into management practices and allow for more holistic conservation including both ecological conservation and sustainable human development (Hoffmann 2007).

Following the biosphere reserve model, Honduras' national parks are comprised of core zones of intact forest and buffer zones where some sustainable land uses are permitted (Pfeffer et al. 2001, Bonta 2005, Margles et al. 2010). Although the buffer zone creates a space that includes both humans and nature within the park, under this model the core zone is considered "off-limits" to local resource users and allowable activities in the buffer zone are defined by non-local organisations (Pfeffer et al. 2001, Gareau 2007). Dissonant understandings of the forest environment between local people and conservation groups has led to conflicts between environmental protection and the needs of people living in the park (Pfeffer et al. 2001, Gareau 2007). Residents in protected areas in Honduras rely on forest resources for: water, clay soils for pots and stove making, fibers from certain trees for ropes and cords, other tree species for firewood and house building and repair, grasses for livestock and fruits and other plant parts for sustenance and for market (Gareau 2007). Putting limits on resource use, without consideration of local understandings of and need for those resources, forces residents to compromise between livelihood and forest protection and often leads to further resource degradation, disconnect from local resource management practices, and poverty (Pfeffer et al. 2001, Jansen et al. 2006, Margles et al. 2010). Research conducted in national parks in Honduras indicates that incorporating local people and their values into park management will allow parks to evolve into "local-spaces" as much as protected areas and allow for more locally appropriate management (Pfeffer et al. 2001, Bonta 2005, Gareau 2007). The end result may be more sustainable communities and more viable protected areas.

1.3 Problem Definition and Research Question

The Fundación AMITIGRA (a Honduran NGO), with support from the Honduran federal parks agency the National Institute for Forest Conservation and Development, Protected Areas and Wildlife (ICF), is responsible for management of La Tigra National Park (LTNP). The park is composed of a core zone (75.9 km²) and a buffer zone (164.5 km²) with 92 communities completely or partially within the park boundaries. People in these communities rely on the land and natural resources of the park (AMITIGRA n.d.). Due to the competing land uses there is often discord between local land and resource uses and conservation priorities (Anariba 2010). My research aims to understand the current relationship between residents and the park and how AMITIGRA and residents can work together to integrate conservation and livelihood goals.

Research questions used to focus the study are:

- What values and perceptions are held by local residents related to the forest and LTNP?
- What are the key issues related to resource conservation and livelihood in LTNP?
- How can AMITIGRA and residents integrate local needs and values into management in order to meet both human and conservation goals?

1.4 Structure

This thesis comprises 9 chapters. The remaining chapters are organised as follows:

In chapter 2 I present a synthesis of background literature relevant to the thesis discussion. The topics of this review include an overview of the importance of protected areas, a description of traditional “fences and fines” protected areas to the inclusion of people in protected areas and a description of the protected areas system in Honduras.

In chapter 3 I describe the methodology used for the research, including the research approach and methods and the rationale for selection.

In chapter 4 I present a background on LTNP and describe the management structure of including strengths and weaknesses in the co-management agreement between AMITIGRA and ICF.

In chapter 5 I discuss results of interview questions related to residents' knowledge and awareness of protected areas and conservation, in particular La Tigra National Park (LTNP).

In chapter 6 I outline the benefits residents of the park perceive from the forest and the park.

In chapter 7 I discuss issues identified by residents of La Tigra National Park (LTNP) related to their experience living in a protected area.

In chapter 8 I discuss the results of the research in the context of local management and position the work into the larger theoretical understanding of people and parks.

In chapter 9 I present the main conclusion of the research, a summary of issues by community, comments on the main implications for protected areas management and recommendations. This chapter also suggests directions for future research.

Chapter Two: Background

2.1 Introduction

The role of protected areas in conserving natural resources is well established; however, the role of humans in these areas continues to be debated. In this chapter I provide a synthesis of the literature related to the role of protected areas in conserving natural areas, a history of the modern conservation movement focusing on protected areas, including discourse surrounding conservation today, as well as an overview of the ‘parks and people dilemma’. To provide more specific context related to conservation in Honduras, I give a brief summary of the social and economic setting in the country and background on environmental protection including an outline of the regulatory history related to conservation and a description of the protected areas system.

2.2 Protected Areas

2.2.1 Why Protected Areas?

Protected areas are a vital part of conserving natural areas and biodiversity in an increasingly human dominated world (Brandon et al. 1998). Establishing and managing protected area systems remains a principal approach of virtually all national and international conservation strategies (Brandon et al. 1998, Terborgh and Van Schaik 2002, Dudley 2008). Officially designated protected areas cover approximately 12.7% of the world’s terrestrial surface, with almost all nations maintaining a protected area system (IUCN&UNEP-WCMC 2011). In recent years estimations of extinction rates are hundreds of times greater than historical background rates and protected areas contribute significantly to the effort to stop threatened or endemic species from becoming extinct (Terborgh and Van Schaik 2002, Dudley

2008). These areas are directly and indirectly beneficial to human populations; both to people living in or near protected areas and people living further away. Protected areas offer opportunities for recreation and spiritual renewal, genetic potential of wild species, and protection of environmental services, such as water, that are provided by natural ecosystems (Dudley 2008). Many protected areas are also essential for vulnerable human societies and conserve places of value, such as sacred natural sites (Dudley 2008).

Tropical forests in particular have high biodiversity value, high vulnerability to human disturbance and high opportunity for conservation (Kramer and van Schaik 1997). The relatively recent creation of parks in the Neotropics is likely a result of increased international awareness of the need for nature conservation in tropical countries, the rapid loss and conversion of natural areas and endemic species and the importance of parks in mitigating these processes (Brandon et al. 1998, Van Schaik and Rijksen 2002). Areas declared as parks in the tropics are largely areas that were perceived as not having been converted to human use, areas at high risk of conversion or areas where individuals have pushed for conservation of a local area (Brandon et al. 1998). The rapid disturbance to tropical forests likely imperils global biodiversity more than any other contemporary phenomenon, and thus these areas are becoming refuges for threatened species and natural ecosystem processes (Laurance et al. 2012). In the wake of increasing population growth and environmental change, conservation of these areas is increasingly important.

2.2.2 History of Protected Areas

Protected areas have existed in various forms since ancient times; however, the modern nature protection movement began with the establishment of national parks in the United States and Europe in the 19th century (Kramer and van Schaik 1997, Davenport and Rao 2002, Aubertin

et al. 2011). The first modern park, Yellowstone Park, was established in 1872 to preserve the “uninhabited” wilderness and landscape as it first appeared to white settlers (Aubertin et al. 2011). By the end of the 19th century, similar protected areas were established in other European colonies with similar intent (Aubertin et al. 2011). The conservation paradigm of the time was twofold with the “preservationists” in favor of setting aside undisturbed areas and preserving pristine habitats for the enjoyment of current and future generations and the “conservationists” supporting the maintenance of forestry reserves for sustainable exploitation (Kramer and van Schaik 1997, Davenport and Rao 2002, Aubertin et al. 2011). In rural areas of Europe, wilderness protection focussed on small, scattered areas in largely transformed human landscapes and thus prioritised endangered species, exceptional environments and picturesque landscapes (Aubertin et al. 2011). The park concept was adopted worldwide in the 20th century and implemented in areas considered to be undisturbed by humans. These areas were largely managed under so called “fortress conservation” or “fences and fines” approach and, as such, local populations were excluded from the area (Aubertin et al. 2011). The park concept continued to grow in popularity and more parks have been created since 1970 than ever before (Brandon et al. 1998).

In the wake of land shortages and growing populations, which were increasing pressure on previously remote protected areas, the social and ecological issues resulting from the “fortress conservation” became apparent during the 1970’s and the whole idea of parks came under attack (Van Schaik and Rijksen 2002, Pfeffer et al. 2006, Aubertin et al. 2011). These criticisms led to the publication of the *World Conservation Strategy* in 1980 (IUCN et al. 1980), the first international document to use the term “sustainable development,” which tried to address the issues with “fortress conservation” (Aubertin et al. 2011). Subsequently, the implementation of

the UNESCO Man and the Biosphere Programme and the first experiences of community-based resource management began to reform the model of natural areas conservation by including communities and local economic issues in conservation policy (Aubertin et al. 2011). This idea continued to grow in international discourse as shown by the 1992 *Convention on Biological Diversity* which promoted the management of nature at the ecosystem level rather than the species level. This represented a step towards a new paradigm where the goal was no longer to lock nature into sanctuaries but to protect ecological processes while maintaining certain human practices and enabling human populations to benefit from conservation (Van Schaik and Rijksen 2002, Aubertin et al. 2011). In 2000 the World Commission on Protected Areas (WCPA) of the International Union for Conservation of Nature (IUCN) and the World Wildlife Fund for Nature (WWF) produced the *Principles and Guidelines on Indigenous and Traditional Peoples and Protected Areas* which recognised that protected areas will survive only if they are seen to be of value to the nation as a whole, and to local people in particular, and promoted the management of protected areas together with indigenous people respecting their traditional environmental knowledge (Beltrán 2000, Aubertin et al. 2011). Participation of local people, rather than a focus on enforcement, became dominant in conservation discourse and led to the emergence of conservation and development projects (Van Schaik and Rijksen 2002, Aubertin et al. 2011).

2.2.3 Protected Areas Discourse Today

Although discourse on protected areas included human interaction and community involvement as early as the 1970's, prevailing political contexts in many areas may not have allowed appropriate practice to be implemented (Borrini-Feyerabend et al. 2004). In recent years the conservation paradigm is once again split between “sustainable use” where it is assumed that

conservation can best be achieved through people's use of resources and "preservation" which excludes local resource use and community involvement in conservation (Brandon et al. 1998). Criticisms of community based approaches stem from the results of many integrated projects that have failed to produce the expected conservation or development outcomes (Brown 2002, Aubertin et al. 2011). Benefits are often difficult to identify and slow to materialize, and may benefit certain sectors of society, such as local political elites or geographically remote organisations, while shutting out some local stakeholders (Chan et al. 2007). The perceived failure of these mechanisms has led to a re-emergence of a focus on ecological and biological sciences to the exclusion of poverty alleviation and livelihood issues in conservation policies (Aubertin et al. 2011). This reversal is conveyed with the rise of large scale protectionist programs in the world's leading conservation NGOs (Aubertin et al. 2011). Proponents of this idea propose that there are limits to sustainable use as a primary tool for conservation and not all resources can be preserved through use (Brandon et al. 1998). They argue that decisions on resource use made for social and political reasons ignore many biological and ecological factors that are likely to compromise both conservation and livelihood concerns (Brandon et al. 1998, Van Schaik and Rijksen 2002).

As a result of the ongoing debate over how best to manage protected areas, today protected areas contain a wide diversity of management objectives, governance structures, models and legal statuses, from sites where no-one is allowed inside to areas that encompass inhabited areas where human actions have shaped the ecological and cultural landscapes (Dudley 2008, Aubertin et al. 2011). The IUCN defines a protected area as "A clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means,

to achieve the long-term conservation of nature with associated ecosystem services and cultural values” (Dudley 2008). The IUCN has six defined categories of protected areas:

- Category I. a) Strict Nature Reserve: managed mainly for science.
- Category I. b) Wilderness Area: managed mainly for wilderness protection.
- Category II. National Park: managed mainly for ecosystem protection and recreation.
- Category III. Natural Monument: managed mainly for conservation of specific natural features.
- Category IV. Habitat/Species Management Area: managed mainly for conservation through management intervention.
- Category V. Protected Landscape/Seascape: managed mainly for landscape/seascape conservation and recreation.
- Category VI. Managed Resource Protected Area: managed mainly for the sustainable use of natural ecosystems.

Although all categories emphasise conserving ecological values, the first four categories focus on limiting human involvement in the protected areas whereas the last two include elements to support social and economic objectives, such as meeting the needs of local populations (Gillespie 2008). This acknowledges the idea that human populations and their related activities may be compatible with a protected area depending on the management objectives (Dudley 2008, Gillespie 2008).

Most tropical protected areas have followed the original U.S. model of exclusion of local resource uses (Kramer and van Schaik 1997, Van Schaik and Rijksen 2002). Yet the process of declaring areas protected does not automatically protect or conserve the area (Brandon et al. 1998, Davenport and Rao 2002). Many of the areas created in Latin America were established

with little or no prior analysis of ecological or social context and received little to no effective management (Brandon et al. 1998, Houseal et al. 1998).

Protected areas of various forms continue to be established, including areas which encompass human interactions with and uses of the area, as illustrated by The Durban Accord and Action Plan and the Convention on Biological Diversity (CBD) 2004 document *Programme of Work on Protected Areas*, which was based on the key outcomes from the Vth IUCN World Parks Congress. This document demonstrates the commitment of conservation organisations to continue to build ecologically-representative and socially responsible protected area systems around the world (Borrini-Feyerabend et al. 2004, Dudley 2008).

2.3 People and Parks Dilemma

Most national parks, particularly in the tropics, are surrounded by human populations that interact with and use the forests and resources the park protects (Schelhas and Pfeffer 2008). Protected areas managers have conventionally seen people and nature as separate entities, often excluding people from the areas, prohibiting their use of natural resources and seeing their concerns as incompatible with conservation (Borrini-Feyerabend et al. 2004). The main issues related to the interface of people and parks identified in the literature are: resource use and livelihood-conservation conflicts, non-local management of local resources and direct conflict and opposition to parks.

Conservation of resources can conflict directly with local land and resource use and, therefore, many protected areas restrict or prohibit local use of natural resources in order to achieve conservation goals such as forest, watershed, and biodiversity protection. People living in and near protected areas often rely on natural resources for livelihood needs such as firewood

for cooking and heat, timber for shelter, grazing land for livestock and non-timber forest products (Alkan et al. 2009). Consequently, under strict protection policies in protected areas, people living in or near protected areas, who are often already economically and/or socially marginalized, may not directly benefit from the exploitation of these resources. This exclusion of benefits can further exacerbate social conflicts (Romero and Andrade 2002, Pfeffer et al. 2006, Gareau 2007). People and communities around the world have been disrupted and impoverished by being forced to abandon the use of resources upon which their livelihoods depended (Borrini-Feyerabend et al. 2004). Imposing land use restrictions in protected areas can also lead to land scarcity (Pfeffer et al. 2001). Management regimes that limit access to certain natural resources can change local tenure systems and systems of rights and rules that apply to resources in the park including land, water, and trees. Such policies, limiting access to resources, can create conditions of relative scarcity and uncertainty about future access to resources (Pfeffer et al. 2001). For example, land left fallow may be targeted for ecosystem restoration and therefore traditional fallow practices may be abandoned and available land may be more intensively cultivated (Pfeffer et al. 2001). Putting such limits on resource use without consideration of local understandings of and need for those resources forces residents to compromise between livelihood and forest protection and often leads to further resource degradation, disconnect from local resource management practices and poverty (Pfeffer et al. 2001, Jansen et al. 2006, Margles et al. 2010). Studies have revealed that strict protectionist approaches in protected areas do not prevent the illegal use of these natural resources by local people and, in fact, sometimes they increase it (Alkan et al. 2009). Faced with this dilemma, people find ways to bend or redefine the rules to fit their needs and values, sometimes compromising established conservation goals (Bonta 2005, Gareau 2007, Schelhas and Pfeffer 2008).

Protected areas are often created and managed by non-local organisations that may have values and goals different from those held by local people. In conventional protected area creation, communities are dis-empowered and control over lands and resources is transferred to governments or private organisations (Borrini-Feyerabend et al. 2004). This may account for much of the lack of success of many natural resource conservation programs, as it presents the issue of potential conflict between local and non-local values and knowledge (Gareau 2007). Protected areas are subject to global ideas of environmentalism and international conservation organisations often provide funding to management bodies (Gareau 2007). Non-local management bodies often prioritise wilderness preservation and global or regional concerns at the expense of local concerns (Pfeffer et al. 2001). That is not to say that local people do not have values and knowledge related to natural resources. Research on local perceptions of nature shows that local peoples often have different understandings of their natural space than do outside groups that establish and manage protected areas (Gareau 2007). These values may still include non-utilitarian and conservation values; however, interpretation of how these values should be implemented may differ at the local scale based on traditional norms and the social and ecological context (Badola 1998, Borrini-Feyerabend et al. 2004, Alkan et al. 2009).

The protection of forests and forest resources in these landscapes can create conflicts between local people and conservation bodies leading to direct opposition of the protected area (Pfeffer et al. 2001, Pfeffer et al. 2005, Schelhas and Pfeffer 2008). Human activities in protected areas such as farming the land, cutting branches for firewood, digging holes to make water catchments, building/improving roads, harvesting fruits, etc. are not recognised in traditional definitions of preservation (Gareau 2007). Given that many of these parks were set up under the “fortress conservation” model without the recognition of the history of human use,

conservation measures often include the building of electric fences around nuclear zones, the hiring of more armed guards, strict enforcement of rules, and even the elimination of buffer zones (Romero and Andrade 2002, Bonta 2005, Alkan et al. 2009). These types of protectionist measures can create a sense of injustice from resource-dependant local people, leading to rebellion and opposition to the park and park management and even lead to intentional illegal activities or setting fire to the forest (Badola 1998, Pfeffer et al. 2001, Alkan et al. 2009, Schelhas and Pfeffer 2009).

Conflicts of this sort are well documented and most authors propose the inclusion of local knowledge and input into protected areas management as a way to mitigate the issues. Protected areas managers have addressed these issues in a number of ways, including: 1) programs for local awareness and environmental education, 2) promotion of development or natural resource management programs, 3) promotion of compatible economic development, and 4) involvement of local people in protected area management (Dugelby and Libby 1998). Despite the potential of these programs, tensions between protected areas and local people are still common (Schelhas and Pfeffer 2005). Such tensions exist primarily because of differing values.

Values are sets of ideals and beliefs that people individually and collectively aspire to and desire to uphold (Jepson and Canney 2003). Values are regarded as principles that aid decision making and convey some sense of what we consider good (Dietz et al. 2005). Literature suggests that values influence people's thinking about and behavior toward the environment by indicating which actions are to be given priority (Dietz et al. 2005). Thus values are a reasonable way of conceptualizing how people make decisions about the environment (Dietz et al. 2005). Values and perceptions or beliefs, defined as a person's experience of the world and facts as an individual perceives them, are thought to influence attitudes (Ajzen 1991, Dietz et al. 2005,

Milfont et al. 2010). Attitudes are positive or negative evaluations of something specific such as a situation or action. Attitudes in turn influence behaviours by incorporating values and perceptions which lead to a motivation to action (Milfont et al. 2010). Studies have indicated that both environmental attitudes and behaviors are influenced by perceptions of environmental situations (Milfont et al. 2010, Vodouhe et al. 2010).

However, values, attitudes and behaviours are not static and changing perceptions and attitudes can change people's values and behaviours (de Albuquerque and de Albuquerque 2005, Vodouhe et al. 2010). Therefore, understanding people's perceptions and values can be valuable in decision-making processes within the parks and people dilemma by improving attitudes and altering behavior. This understanding and resultant change can lead to resolution of issues between local people and park authorities (Vodouhe et al. 2010)

The literature calls for a better, integrated interpretation of the benefits and costs of nature conservation, and purports that conservation biologists must be more interdisciplinary in order to design ecologically, culturally, politically, and socioeconomically appropriate conservation plans (Chan et al. 2007). Whereas in the past, governments often made decisions about protected areas and informed local people afterwards, today there is greater recognition of the importance of discussions with stakeholders and joint decisions about how such lands should be set aside and managed (Dudley 2008).

2.4 Honduras

Honduras is the second largest country in Central America with an area of 112,498 km² (Leonard 2011). The population exceeds 8 million people, and is growing at 1.8%/year (CIA 2012). Approximately 90 percent of the population is mestizo, 7 percent indigenous, 2 percent

black and 1 percent white (CIA 2012). In 2010, urban population accounted for 52 percent of the country's population, centralised in the country's capital, Tegucigalpa, and the main business city, San Pedro Sula (Leonard 2011, CIA 2012).

Three topographical features characterize Honduras: an extensive interior highland that covers approximately 80 percent of the country and two coastal lowlands on the Pacific and Caribbean coasts. Soil, particularly in the highlands, is poor and lacks the rich fertile volcanic ash found elsewhere in Central America (Leonard 2011). Livestock and commercial agriculture are widely practised on the flatlands along the coasts and in numerous valleys throughout the interior highlands while subsistence agriculture is relegated to the mountain slopes (Leonard 2011). The three geographic regions also experience distinct climates. The interior highlands are characterized by a marked dry season and temperature decreases as elevation increases. Average temperatures in the valleys of the interior highlands are approximately 30°C; however, temperatures in the mountains can regularly drop to near 0°C (Leonard 2011). The Pacific and Caribbean coasts have more consistent year round temperatures of 27 to 31°C and high humidity levels (Leonard 2011).

The economy of Honduras has traditionally been based on primary production, particularly agriculture, livestock, forestry and mining (Benitez-Ramos et al. 2005, Leonard 2011). For much of the first half of the 20th century, the country's economy was dependent on foreign-owned banana companies (Benitez-Ramos et al. 2005, Leonard 2011). Concessions given to the large fruit companies and investments in infrastructure during this period brought little prosperity to the country and created an economy of indebtedness which has persisted (Benitez-Ramos et al. 2005, Leonard 2011). In the second half of the 20th century, export agriculture was diversified to include a number of crops including cotton and melons, which

have been subject to boom and bust cycles and high environmental and health impacts from high pesticide use and increased demand for agricultural land (Benitez-Ramos et al. 2005). Today coffee in the highlands, along with lumber and tropical fruits from the lowlands are the most important economic exports (Benitez-Ramos et al. 2005, Leonard 2011). Despite the potential of the country's forest resources, they have been poorly developed as a sustainable and equitable source of income. Major obstacles including inefficiency, corruption and lack of regulatory capacity on the part of the government have impeded growth in this sector (Benitez-Ramos et al. 2005).

In recent years, the economy has undergone some diversification with the growth of light industry, particularly clothing and textiles; however, this has also led to some problems as urban centres have grown as a result of immigration for employment (Benitez-Ramos et al. 2005, Leonard 2011). Tourism, as another potential source of diversification has not been well developed in part due to security concerns (Benitez-Ramos et al. 2005).

Throughout Honduras, and especially in the highlands, subsistence farming remains the main occupation of farmers, including cultivation of food for local markets (Leonard 2011). Main crops include maize, beans, sweet manioc, sorghum and plantains (Leonard 2011).

2.4.1 Environment in Honduras

Honduras has a wide variety of ecosystems and a high level of biodiversity (Portillo-Reyes 2007). It is estimated that 87.7% of the country's total area (112,498 km²) is most highly productive as forest (Vallejo Larios 2003). Honduras also has one of the highest levels of poverty in the Americas and thus existing forests are under substantial pressure from largely uncontrolled colonisation of forested lands by landless farmers, loggers and cattle ranchers (Beltrán and Esser

1999, Leonard 2011). It has recently been estimated that 60 percent of the land with needle-leaf forests in Honduras are privately owned, whereas 80 per cent of the land with broadleaf forest are public property. However, these figures should be interpreted as preliminary as there is no complete cadastre and the ownership of large parts of the country's territory remains unclear (Beltrán and Esser 1999, Gareau 2007)

Development policies, promoting and subsidising industrial cattle raising and other extensive agricultural activities, have often displaced peasant populations into marginal areas (Beltrán and Esser 1999). Such development policies have led to disproportionate land tenure, with 4 percent of the landowners in Honduras owning 56 percent of the farmland, relegating the poorest land for subsistence and near-subsistence farmers (Gareau 2007). These areas tend to be the high altitude, extremely steep, mountain regions, where land plots are generally 2 ha or less and farmers are often forced live in and cultivate environmentally sensitive areas such as the headwaters of watersheds and protected areas (Gareau 2007). Additionally, the collection of firewood, which produces 65 to 70 percent of the energy consumed in the country, contributes largely to forest degradation. Firewood is used by 29 percent of the urban population and 100 percent of the rural population (Vallejo Larios 2003). Due in part to these pressures, combined with industrial forestry and agriculture and illegal logging, between 1965 and 1990, approximately 23 per cent of the country's forest cover was lost, at a rate of approximately 88,000 – 108,000 ha annually (Beltrán and Esser 1999, Vallejo Larios 2003). Currently only half of the land area considered to be most appropriate for forests still has forest cover (Beltrán and Esser 1999, Vallejo Larios 2003).

2.4.2 Environmental Regulatory History

Honduras has a long regulatory history of legislation related to natural resources. Since the mid-1800s the Honduran government has issued a series of land, forest and protected areas laws that have contributed to the creation of current policies of protected areas management (Barton 2001). The first forest law was issued in 1850 and was applied explicitly to the forest on the north coast. This law designated ownership of trees on private lands to the land owner, but also included substantial taxes on trees cut for non-subsistence use. However, implementation of the tax law was infeasible and was replaced in 1851 by a more reasonable sales tax on wood. This sales tax on wood that lasted until 1880 (Barton 2001). In 1909, in an effort to regulate and gain revenue from trade in wood species, Honduras instituted the Forests Law requiring a permit to cut, transport or export highly valuable trees on state or private lands.

The concept of national reserve zones was first introduced through the Agrarian Law of 1924 (No 6-620, Article 51). National reserve zones were defined to include land within 40 km of a shoreline or national border, all island and keys, village ejido (common) lands and lands with ruins from ancient cultures. Although these lands were set aside largely for the purpose of colonization and land reform, their creation established two norms related to protected areas that shaped the eventual policy of the protected areas system: 1) the right of the state to reserve and directly manage lands and 2) the combination of resource conservation and human use of national reserve areas (Barton 2001). Application of natural reserves was first implemented in 1931 with the creation of the Gulf of Fonseca National Reserve Zone and the La Mosquitia State Reserve Zone for Colonization and Forestry Reserve which combined land reform and conservation (Barton 2001).

In 1939, a new Forest Law that included watershed protection, reforestation, and regulation of cutting and burning was enacted. Under this law, altering forest vegetation within 100 meters of natural springs and 20 meters of water courses was prohibited. Additionally a permit was required to cut trees or burn forest, the area had to be reforested within one year and permits would not be issued for forested lands adjacent to settlements (Barton 2001).

Resource management agencies were first established in 1955 with the creation of the Forestry Police and the new Forest Law that created the first Forestry Service. This law also established two types of protected areas on non-private lands: Reserved Forests which prohibited any alteration of vegetation, wildlife or soil and Protected Forests which allowed grazing, burning, cutting and extraction of forest products, subject to regulations (Barton 2001). The idea of national parks arose in Honduras in 1959 with Article 7 of the law creating a Reserved Forestry Zone which directed the Secretary of Natural Resources to study the advantages of designating the area as a national park; however, at the time no legal mechanisms for creating a national park existed and no legal action was taken (Barton 2001).

In 1961 the Forest Law was once again revised to expand the system of forest tenure and create the State Forestry Administration (AFE) to administer forestry regulations. This law also re-categorised the protected areas into Excluded Forestry Zones which prohibited commercial harvest, Protected Forestry Zones that could be harvested according to plans approved by AFE and Reserved Forestry Zones that consisted of unclassified public forestry lands (Barton 2001). Articles 63-64 of this law also legally created the category of national park. Shortly after, a repressive military government came into power and conservation of natural resources was no longer a priority and therefore no national parks were created at this time (Barton 2001).

Return to recognition of Honduras as a forest-dependent country was illustrated in 1972 by the Forest Law (Decree No. 85) which had the objective of achieving the maximum direct and indirect benefits possible from flora, fauna, water and soils in the forested areas and assuring their protection, improvement and use (AFE-COHDEFOR/IUCN 2006). The Honduran Forest Development Corporation (COHDEFOR), a semiautonomous organisation connected to the Ministry of Agriculture and Livestock (SAG), was created in 1974 (Decree No. 103) with the purpose of managing government-owned forests and generating revenue from their exploitation (AFE-COHDEFOR/IUCN 2006, Jimenez-Castro 2008). With this decree, the state assumed management of all forest related activities and restricted the general population's access to forests (Vallejo Larios 2003). At the same time, the Department of Natural Renewable Resources (RENARE) was formed as a branch of the Ministry of Natural Resources and was given the responsibility of protection of wildlife and protected areas administration (Barton 2001).

The first national park, La Tigra National Park, was created in 1980 as a pilot park with the primary objective of protecting Tegucigalpa's water supply. The Rio Platano Biosphere Reserve, Honduras' first protected area of international concern, was created in the same year to combine protection of tropical forests and native communities and the development of sustainable agricultural industries (Barton 2001). In 1982, protected areas were included as a provision in the new constitution (Barton 2001). Article 172 of the Constitution of 1982 states:

Honduras' cultural heritage is comprised of the nation's anthropological, archeological, historic and artistic treasures. The law shall establish the norms that shall serve as a basis for their conservation, restoration, maintenance and restitution, as necessary. It is the duty of all Hondurans to vigilantly ensure their conservation and prevent their destruction.

Sites of natural beauty, monuments, and reserved zones, shall be under the protection of the State. (Honduras/ANC 1994).

In 1987 the Cloud Forest Law (Decree 87-87) designated a system of protected areas to promote the conservation of natural resources and the preservation of ecosystems (AFE-COHDEFOR/IUCN 2006). These areas included all lands over 1,800 meters above sea level (Pfeffer et al. 2001, Pfeffer et al. 2005). The system was comprised of 36 protected areas, the majority of which were cloud forests and included 10 national parks, 8 wildlife refuges and 19 biological reserves (AFE-COHDEFOR/IUCN 2006). The protected areas were initially managed by the Department of Wildlife of the General Directorate of Renewable Natural Resources of the Ministry for Natural Resources; however, in 1991 this responsibility was transferred to the newly created Department of Protected Areas and Wildlife (DAPVS) of COHDEFOR (Vreugdenhil X et al. 2002, AFE-COHDEFOR/IUCN 2006, Jimenez-Castro 2008).

The centralized administration of forests, created in 1974, was imposed until 1992 when the Law for Modernization and Development of the Agricultural Sector (Decree No. 131) reversed some of State's power over forests and decentralizing management by declaring the conservation and regeneration of forests as an issue of public interest. Forests became part of the responsibility of individuals on private lands and the municipal governments on ejido lands (municipal common lands) (AFE-COHDEFOR/IUCN 2006, Gareau 2007, Jimenez-Castro 2008). The state's role was limited to directly administering the national areas and management of the areas was transferred from RENARE to COHDEFOR whose name was changed to State Forest Administration of the Honduran Corporation for Forestry Development (AFE-COHDEFOR) (Beltrán and Esser 1999, Vallejo Larios 2003, AFE-COHDEFOR/IUCN 2006). Despite limiting the authority of the State in forest management, the role of AFE-COHDEFOR

in protected areas management was ratified. Additionally, through this decentralization, the feasibility of the involvement of external parties in the management of protected areas was identified (AFE-COHDEFOR/IUCN 2006, Jimenez-Castro 2008).

In 1993, the General Environmental Law (Decree No. 104-93, Article 36) created the National System of Protected Areas of Honduras (SINAPH) including 18 categories of protected areas (Vreugdenhil X et al. 2002, AFE-COHDEFOR/IUCN 2006). At this time the authority of AFE-COHDEFOR in natural resources management was further reduced by decreasing its responsibility for protected areas. This law established that AFE-COHDEFOR should share the responsibility of the implementation of forest policies with local governments (municipalities) and provided the legal basis for the involvement of civic groups, private organisations and federal organisations in the conservation of the country's protected areas. This, in turn, opened the door to co-management of protected areas (AFE-COHDEFOR/IUCN 2006, Jimenez-Castro 2008).

The management structure underwent further changes in 1996 with the Reforms to the General Law of Public Administration (Decree No. 218) that converted the Ministry of the Environment into the Ministry of Natural Resources and Environment (SERNA). Under this reform SERNA was assigned the responsibility of creating and evaluating policies related to the environment and protected areas, while AFE-COHDEFOR was mandated with the implementation of policies and operational management (Vreugdenhil X et al. 2002, AFE-COHDEFOR/IUCN 2006, Jimenez-Castro 2008). The SERNA acts as a decentralised institution with an office in each municipality. These offices, funded by the municipalities, are responsible for the local implementation of environmental legislation (Jimenez-Castro 2008).

Finally, in 1997 Agreement No. 921 “Regulations of the National System of Protected Areas of Honduras” established the terms of reference of the operative, administrative and coordinative bodies of SINAPH. SINAPH is organised in three administrative levels: strategic, management and operations and responsibilities are shared by the involved actors (AFE-COHDEFOR/IUCN 2006). The objectives of SINAPH are to:

- Ensure the conservation of natural resources and biodiversity in the protected areas of the country.
- Achieve high social benefits and economic sustainability of the protected areas.
- Provide the legal and administrative instruments to the State and the involved social sectors to adequately manage the protected areas (AFE-COHDEFOR/IUCN 2006).

The DAPVS of the AFE-COHDEFOR assumes the general responsibility of the country’s protected areas through six main activities: implementing conservation policies, elaborating management plans, managing tourism, attending to the public, facilitating environmental education within and around protected areas and coordinating institutional collaboration regarding the management of the areas (Vreugdenhil X et al. 2002, Jimenez-Castro 2008).

Of particular importance in these regulations was the mandate for the establishment of Local Councils for Protected Areas (COLAP). These councils were created to promote and enable the participation of all stakeholders in the protected areas. The Regulations for the SINAPH established that the COLAPs need not have a specific structure or be new organisations, as long as they were effective (Jimenez-Castro 2008). In 2000, DAPVS also developed a mechanism for evaluating protected areas management plans. These plans are

considered to be the basic document by which co-management agreements are established and management of the protected area is established (Jimenez-Castro 2008).

On September 13, 2007 the National Congress approved the Forest Law Protected Areas and Wildlife, which was officialised on February 14, 2008 by the President of the Republic, according to the Decree No. 98-2007. The Forest Law, Protected Areas and Wildlife represents the first Honduran law dedicated to protected areas (Jimenez-Castro 2008). It institutes significant changes in the regulatory regime of forest management and creates the National Institute of Forest Conservation and Development, Protected Areas and Wildlife (ICF) which replaces AFE-COHDEFOR in the operational management and legal implementation of the SINAPH. The new forest law focuses on four main areas: 1) Promotion and development of the primary and secondary forestry sectors, 2) Management of protected areas and wildlife including the SINAPH, 3) Establishment of the Consultative Councils for Forests, Protected Areas and Wildlife, (COCONAFOR) which will facilitate participation and consultation at the national, departmental, municipal and community levels and 4) The creation of the Research System for National Forests, Protected Areas and Wildlife (SINFOR), which will conduct and promote scientific and applied research in forestry.

2.4.3 Protected Areas in Honduras

In the 1980s and 1990s, in response to habitat destruction and biodiversity loss, governments across Latin America began creating or enlarging systems of parks under the model of parks systems in the USA and Europe (Bonta 2005). Honduras was the last of the Central American countries to create a national parks system with the establishment of its first national park, La Tigra, in 1980 (Gareau 2007). The 1987 National Law 87-87 designated a system of

protected areas, which included all lands over 1,800 meters above sea level (Pfeffer et al. 2001, Pfeffer et al. 2005). To manage these areas, the General Environmental Law (1993) created a National System of Protected Areas of Honduras (SINAPH) as a body of inter-institutional coordination to define the rules concerning the operation administration and coordination of the system (Sandoval Corea 2006). By 2000 Honduras possessed over 100 protected areas covering about 22 percent of the Honduran land base, including 37 high-altitude humid cloud forests protected under National Law 87-87 and much of the mid-altitude and lowland humid broadleaf rain forests perceived to be relatively free from human-caused habitat destruction (Pfeffer et al. 2001, Bonta 2005, Pfeffer et al. 2005, Gareau 2007).

Honduran national parks were delimited to include a core or nuclear zone of “untouched” cloud forest. Core zones were delineated on maps and, in managed areas, were demarcated on the ground through signs, paint marks on trees, and other territorial means (Bonta 2005). These areas are open to ecotourists, researchers and park employees (Bonta 2005). Core zones are surrounded by buffer zones in which some local “sustainable” land and resource uses are permitted while others, such as hunting, gathering, and tree felling are curtailed (Bonta 2005, Timms 2011). Residents were allowed to remain as long as no further forest clearance occurred (Bonta 2005, Timms 2011). According to the original 1987 law, buffer zones should be at least one kilometer wide and often include second-growth rain forest, pine woods, villages, fields, and other obviously human affected areas (Bonta 2005).

The rapid expansion of this system of protected areas created many management problems, including lack of local economic sustainability and conflicts between environmental protection and the livelihood needs of people living in and near the parks, that are still being dealt with today (Pfeffer et al. 2001, Pfeffer et al. 2006). Due to a lack of government funding,

most of Honduras' parks exist largely on paper, management plans are not implemented and most areas receive little to no official protection and are thus, in actuality, treated as if they are not protected at all (Beltrán and Esser 1999, Bonta 2005, Gareau 2007). This leaves many protected areas highly susceptible to resource degradation (Gareau 2007). Additionally, of the 107 areas declared as protected, only four are registered in the Inalienable Public Forest Catalogue, which guarantees conservation in perpetuity (Sandoval Corea 2006). The lack of funding along with modest political and governmental support also amounts to a lack of biodiversity information and protection, thus compromising the country's ability to protect its natural spaces (Beltrán and Esser 1999, Gareau 2007).

To mitigate this lack of government protection, the management of several protected areas in Honduras has been decentralised from government to non-governmental organisations (Jimenez-Castro 2008, Timms 2011). The 1993 Executive Agreement (1039/1993) allowed the management of public protected areas by NGOs, community groups, corporations, or even individuals willing to fund conservation programs (Beltrán and Esser 1999, Timms 2011). Under this agreement, co-management is negotiated for each site between AFE-COHDEFOR (now ICF) and the co-managing organisation. Responsibilities of the co-managing organisation may include employment of park staff, the implementation of scientific research and the construction or removal of infrastructure (Beltrán and Esser 1999). Occasionally, the management of a public protected area can be directly delegated to a NGO or community group by means of a presidential decree (Beltrán and Esser 1999). Currently there are 27 organisations that manage protected areas in the country (Sandoval Corea 2006). Although the non-governmental sector makes important contributions to the conservation of protected areas (Beltrán and Esser 1999), Timms (2011) argues that this Executive Agreement which initially appeared to decentralize

conservation decision-making from the state to local interests, really only shifted control from the state to international development agencies and associated foreign controlled NGOs. Managing organisations are often funded by external aid and it is therefore likely that the management priorities of Honduran protected areas are influenced by demands of their financial supporters (Beltrán and Esser 1999, Jimenez-Castro 2008).

Discordant understandings and values of the forest environment between local people and conservation groups has led to conflicts between environmental protection and the needs of people living in protected areas in Honduras (Pfeffer et al. 2001, Gareau 2007). Residents rely on forest resources for: water, clay soils for pots and stove making, fibers from certain trees for ropes and cords, other tree species for firewood and house building and repair, grasses for livestock and fruits and other plant parts for sustenance and for market (Gareau 2007). Buffer zones in Honduran parks were designed to mitigate influences of “unsustainable” human practices on the “untouched” core zone (Bonta 2005). Although buffer zones act as a compromise and a zone of transition, they do not automatically create harmony between human and conservation goals (Bonta 2005). Recent studies in the region are critical of strict conservationists’ propensities to separate “human” and “nature” and to largely ignore the local adaptive environmental knowledge systems (Pfeffer et al. 2001, Bonta 2005, Pfeffer et al. 2006, Gareau 2007, Timms 2007, Schelhas and Pfeffer 2010, Timms 2011). These studies examine the management of parks in Honduras and question who determines what practices are allowed inside and outside management zones and purport that a better understanding and involvement of local needs and conservation knowledge are needed.

2.5 Conclusion

The ability of parks to protect both biodiversity and human use values depends on the use and management of these areas and, while it is generally agreed that these resources need to be protected, there is little consensus on how it should be done and what should be prioritised (Brandon et al. 1998, Schelhas and Pfeffer 2008). Literature of protected areas in Honduras and around the world continues to call for more interdisciplinary studies and management plans to mitigate the parks and people dilemma and allow for protected areas which meet ecologically and socially appropriate objectives.

Chapter Three: Research Methods and Process

3.1 Introduction

In this chapter I discuss the research strategy and methods used in this research and the rationale for selection of each. Ethical considerations of this research and validity of the data are also discussed.

3.2 Research Strategy

In this study I used a Participatory Action Research (PAR) approach. PAR is becoming an accepted and leading paradigm within the social and environmental sciences (Kindon et al. 2007a). PAR involves researchers and participants working together to define and examine a problematic situation, engage in planning implementation and dissemination of the research process and creation of action to change the problem for the better (Kindon et al. 2007a, McIntyre 2008). It proposes that identification of issues and decisions related to change should involve those affected by the proposed changes (McTaggart 1991). Typically, participatory approaches prioritise local community concerns, specific social and geographical contexts, and ground up processes (Kindon et al. 2007a).

Diverging from traditional academic research where knowledge is believed to reside in the formal institutions of academia and policy, PAR recognises a plurality of knowledges and shared learning between a variety of institutions (Kindon et al. 2007b, McIntyre 2008). Within PAR, collaboration at all stages of reflection and action is ideal; however, levels of participation by co-researchers and participants may vary significantly and often the quality of participation is more important than the proportionality of participation (Kindon et al. 2007b, McIntyre 2008). Authentic participation includes collaboration in research that is conceptualized, practiced, and

brought to bear in the real-life world. It requires responsibility of the researcher and participant agency in the production of knowledge and the improvement of practice not through imposition but through individuals and groups agreeing to work together to change themselves, individually and collectively (McTaggart 1991).

According to the list of key characteristics in Kindon et al. (2007b) PAR:

- Aims to change practices, social structures and social media which maintain irrationality, injustice and unsatisfying forms of existence.
- Treats participants as competent and reflexive agents capable of participating in all aspects of the research process.
- Is context-bound and addresses real-life problems.
- Integrates values and beliefs that are indigenous to the community into the central core of interventions and outcome variables.
- Involves participants and researchers in collaborative processes for generating knowledge.
- Treats diverse experiences within a community as an opportunity to enrich the research process.
- Leads to the construction of new meanings through reflections on action.
- Measures the credibility/validity of knowledge derived from the process according to whether the resulting action solves problems for the people involved and increases community self-determination.

The implementation of PAR is context specific and there is no fixed formula for designing and implementing participatory research; however, the process often includes the

researcher and participants identifying an issue or situation in need of change, field research which draws on capabilities both researcher and participants, and creation of an action or outcome. Both researchers and participants engage in self and collective reflection to learn from this action and proceed to a new cycle of research/action/reflection (Kindon et al. 2007a, McIntyre 2008). Due to the fact that PAR is context specific, practitioners draw on a variety of quantitative, qualitative, and creative-based methods including participant observation, interviews, focus groups, field notes, logs, document analysis, mapping and dramatization (McTaggart 1991, McIntyre 2008). Validation can be accomplished by a variety of methods including triangulation of observations and interpretations, by participant confirmation, and by testing the coherence of arguments being presented (McTaggart 1991).

Participatory action research is appropriate for this research because the physical and attitudinal relationships of local people cannot be considered without taking into account the context and knowledge of the people most affected by the research. I approached all stages of the research with an appreciation for local knowledge and the context-specific problem in mind. Where possible, residents and/or the Fundación Amigos de La Tigra (AMITIGRA) were involved in the research process including: problem identification, development of research questions, data collection, definition of issues and development of recommendations. The research aims to define issues related to resource conservation and livelihood as identified by both the communities and AMITIGRA and use this research process to create recommendations for action. Employing a PAR approach in research encourages more local-level participation and empowerment, changing the relationship between the NGO and local communities towards more collaborative arrangements (Gavin et al. 2007, McIntyre 2008).

Critics of PAR argue that participatory approaches have weaknesses which may produce negative power effects including:

- Production of participants as subjects requiring research/development.
- Retention of researchers control whilst presenting them as benign arbiters of neutral processes.
- Re-authorisation of researchers as experts in participatory approaches.
- Romanticisation or marginalisation of local knowledge produced through participatory processes.
- Reinforcement of pre-existing power hierarchies among participating communities.
- Legitimisation of elite local knowledge simply because it is produced through participatory processes.

The potential negative power effects of PAR were mitigated through addressing an issue previously identified as problematic by participants, involving participants where possible throughout the research process, acknowledgement of the value of local knowledge, having participants from several communities and organisations (including managers, local leaders and non-leaders) and respecting data from different sources including interviews and document review. Although PAR was used for this research, not all criteria of PAR were employed. Due to funding and time restrictions full implementation of the recommendations resulting from the research were not possible in this process. Implementation of recommendations and evaluation of outcomes will be the responsibility of the research participants, AMITIGRA and resident communities.

3.3 Data Collection Methods

3.3.1 Site and Community Selection

The site of the research is La Tigra National Park (LTNP), Honduras. Participatory research is best approached through invitation (McIntyre 2008). This site was chosen through a request from the organisation which manages the park (AMITIGRA) based on my prior relationship with the organisation and residents in the park. From February 2004 to July 2005 I lived and worked as a biologist in La Tigra National Park. Due to the distinctive social and environmental context, LTNP provides an interesting case to examine conservation and livelihood issues in protected areas. Using my previous observations of the park and communities in the park, as well as AMITIGRA's concern over increasing community conflicts, the research questions for the study and intended outputs were jointly created with AMITIGRA over the course of several months in early 2011.

Upon arrival in Honduras in September 2011, meetings were conducted with AMITIGRA managers to aid in community selection. Communities were selected to cover different geographic areas of the park as well as include communities in both the core zone and the buffer zone. Geographic coverage and management zone are considered to be appropriate for selection because influence of park management, benefits and relationship with the park and its resources were expected to differ in different areas of the park and within the different management zones. Communities selection also took into account the perceived relationship of each community with AMITIGRA based on meetings with managers to ensure a range of opinions were collected regarding the park and park management. Although the term community can have many different definitions, for the purpose of the research "communities" were defined by place of residence within the park boundaries. This was considered suitable as place of residence identified people

who are likely to have face-to-face encounters and/or direct mutual influences from the park and park management in their daily life (Borrini-Feyerabend et al. 2004).

Five communities were selected to conduct resident interviews (Figure 3-1). Table 3-1 shows the communities selected and socio-economic characteristics of each community.

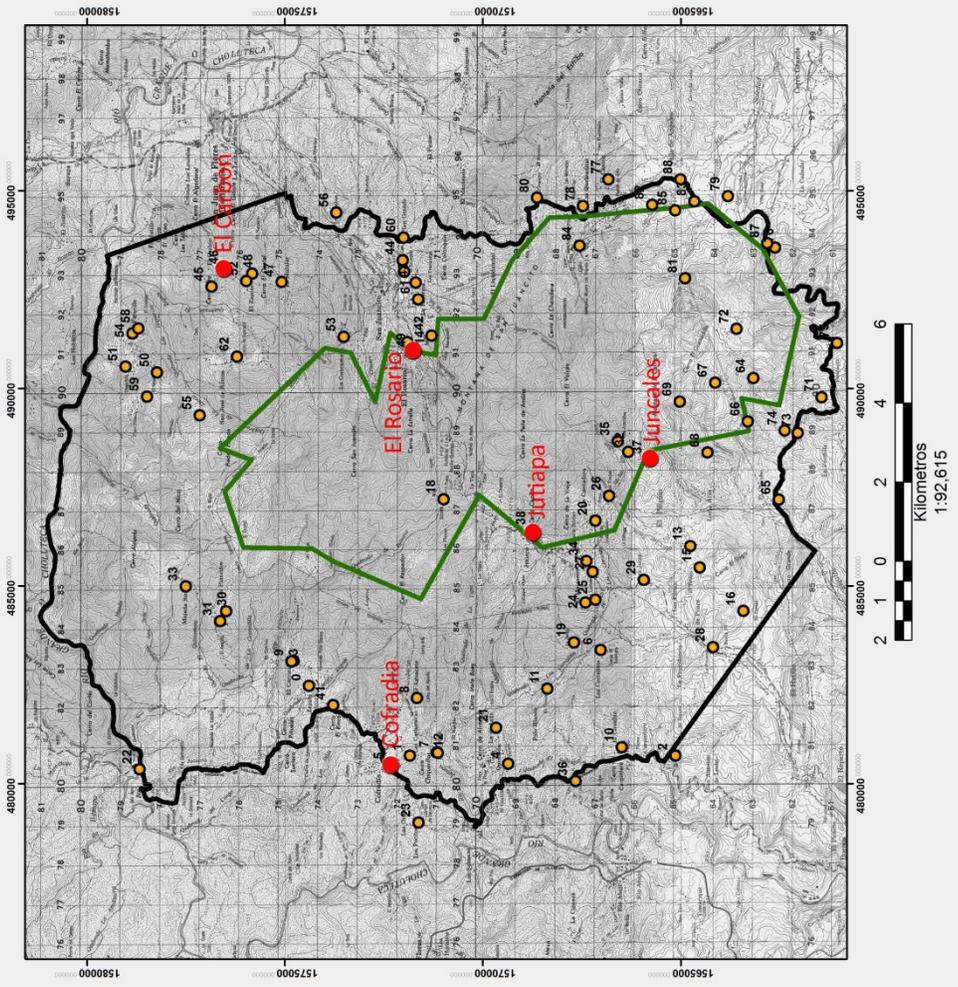
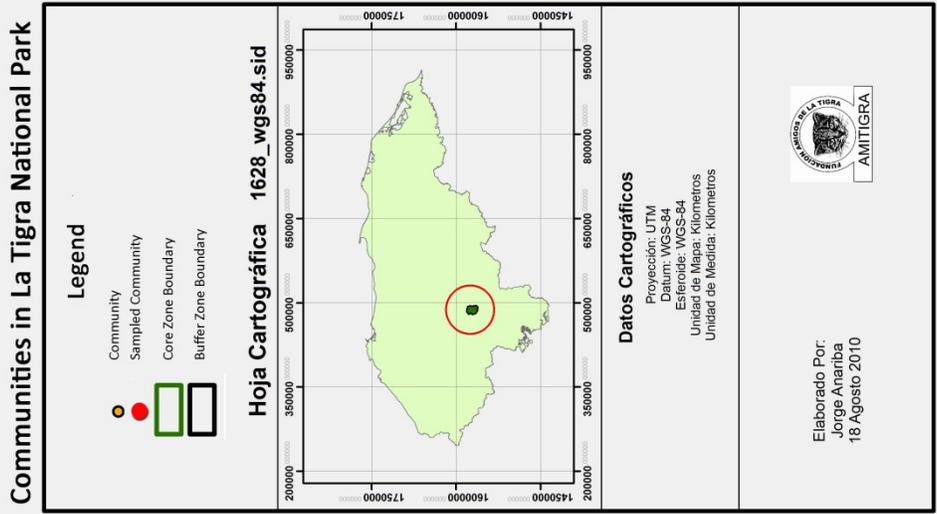


Figure 3-1 Selected Communities in La Tigra National Park

Table 3-1 Characteristics of Participant Communities

	Jutiapa	Cofradía	Juncales	El Rosario	El Carbón
Population	533	645	217	141	180
Number of households	86	42	35	25	29
Park Zone	Core and buffer	Buffer	Buffer	Core and buffer	Buffer
Principal economic activities	<ul style="list-style-type: none"> · Subsistence agriculture · Floriculture and horticulture · AMITIGRA 	<ul style="list-style-type: none"> · Subsistence agriculture · Labour in Tegucigalpa 	<ul style="list-style-type: none"> · Subsistence agriculture · Floriculture and horticulture · Labour in Tegucigalpa 	<ul style="list-style-type: none"> · Subsistence agriculture · Coffee production · AMITIGRA 	<ul style="list-style-type: none"> · Subsistence agriculture · Labour in sugarcane plantations
Public services	<ul style="list-style-type: none"> · Electricity (76%) · Running water (75%) · Cellular phone reception · Public transportation · Health centre · Primary school and kindergarten 	<ul style="list-style-type: none"> · Electricity (88%) · Running water (91%) · Cellular phone reception · Public transportation · Health centre · Primary school 	<ul style="list-style-type: none"> · Electricity (20%) · Running water (80%) · Cellular phone reception · Primary school 	<ul style="list-style-type: none"> · Electricity (92%) · Running water (92%) · Cellular phone reception · Primary school 	<ul style="list-style-type: none"> · Running water (90%) · Cellular phone reception · Primary school
Community organisations	<ul style="list-style-type: none"> · Town Council · Water Administration Board · Parents Society · The Jutiapa Campesino Association · The Jutiapa Cooperative 	<ul style="list-style-type: none"> · The Commons of Cofradía Association · Town Council · Water Administration Board · Parents Society 	<ul style="list-style-type: none"> · Town Council · Water Administration Board · Parents Society 	<ul style="list-style-type: none"> · Town Council · Water Administration Board · Parents Society · The Coffee Producers Association 	<ul style="list-style-type: none"> · Town Council · Water Administration Board
SOURCE: (AMITIGRA 2004, 2006)					

3.3.2 Document Review

Document review was conducted in Honduras during the month of September 2011. During this time AMITIGRA operational documents and reports were reviewed to identify current management objectives and practices as well as previous programs and research related to resource management, livelihood issues and community participation. Operational documents and management plans also provided a base for comparison of official goals and operations of AMITIGRA and the managers' perceptions of how these goals were implemented in practice as expressed in key informant interviews. All operation documents and plans are written in Spanish.

Document review also provided a basis for community selection and contributed to development of the key informant and resident interview guides.

3.3.3 Interviews

Face-to face interviews were used to collect information from AMITIGRA and National Institute for Forest Conservation (ICF) managers and park residents. In depth interviews allow for exploration of people's views, attitudes and the meanings and allow the researcher to 'probe' for more detailed responses where a question or response needs further clarification (Gray 2004). Both structured and semi-structured interview questions were used. Structured interviews are used to collect data for quantitative analysis using standardized questions about the interviewee (Gray 2004). Structured interviews are often used as a precursor for semi-structured or more open-ended questions (Gray 2004). Semi-structured interviews are non-standardized, and are used in qualitative analysis. The interviewer has a list of issues and questions to be covered, but may modify the interview as new issues arise (Gray 2004). Semi-structured interviews allow for probing of responses where the interviewer wishes the respondents to expand on their answer.

This is important to understand subjective meanings in interviewees' responses. Such probing may also allow for the interviewer to discover new issues not previously considered in the interview (Gray 2004).

For the purpose of this research, interviews were the best method for collecting this information because it is information that needs to come directly from people and involves not just factual information but also information on meaning, motives and reasons (Gray 2004, DiCicco-Bloom and Crabtree 2006). More structured question types were used for biographical information whereas less structured or open-ended question types were used for attitudes, beliefs and physical context allowing for a range of information to be collected. This necessitated both quantitative and qualitative data analysis. Interviews are appropriate for this research as they allowed me to delve more deeply into social and personal matters that may not be as easy to explore in a group setting or a questionnaire (Gray 2004, DiCicco-Bloom and Crabtree 2006). Additionally, due to logistical restrictions (literacy, lack of telephones or mailing addresses) in-person interviews were most appropriate in this context.

3.3.3.1 Key Informant Interviews

Key informant interviews involve interviewing a select group of people who can provide information, ideas and insights on a particular subject (Tremblay 1957, Kumar 1989). Key informant interviews are appropriate where general, descriptive information is needed and when understanding of motivations and attitudes of the interviewees is needed (Kumar 1989). For the purpose of this research this information includes the general context of current management and interpretation and implementation of laws and mandates for LTNP. Key informant interviews

are also appropriate when preliminary information is needed for the design of the study and where recommendations are being generated (Kumar 1989).

Key informants were chosen through purposive sampling (Nishikawa 2003) of ICF and AMITIGRA personnel who are involved in the planning and management of the park. Structured and semi-structured questions were used to collect information on management of the park, resource conservation and livelihood issues and co-management between AMITIGRA and ICF (see Appendix A). Transcribed text from interviews was used to understand how the park is currently managed, strengths and weaknesses of the organisation in meeting goals, current or past involvement of park residents and key issues identification in order to develop the interview questions as well as to inform the design of recommendations (Kumar 1989).

Four key informant interviews with senior management of AMITIGRA and the ICF manager responsible for the state parks were conducted from October 4-10, 2011. Interviews were scheduled in advance and conducted in the office of the interviewee. All interviews were conducted jointly by me and the field assistant to ensure consistency between interviews and allow for discussion of each interview after the interview was complete. Interviews were recorded using a Sony MP3 digital recorder and later transcribed by the research assistant and me.

Limitations to key informant interviews that may be relevant to this study are: bias of the key informant, and potential difficulty in demonstrating validity of findings with a small sample size (Kumar 1989). These limitations were mitigated in part by triangulation of different data sources (documents, key informant interviews, resident interviews).

3.3.3.2 Resident Interviews

The participants selected to be interviewed were people living in the five study communities within the boundaries of LTNP (residents). Participants in each community were selected through snowball and opportunistic sampling (Wellington and Szczerbinski 2007). Structured, semi-structured and open questions were used to collect information on biographical information, physical context and residents' perceptions of and experiences with the park resources and park management, and key issues related to resource use and conservation and livelihoods (see Appendix B). Schelhas and Pfeffer (2008) was used as a guide for creating interview questions related forests and conservation. Interview guides were updated during the first few weeks of interviews to modify questions that were not working and add questions based on initial responses.

Interviews were conducted with a total of 55 residents from five communities within the core and buffer zones of the La Tigra National Park from October 9 – November 27, 2011 (Table 3-2). Communities where interviews were conducted were Cofradía (12 interviews), El Carbón (10 interviews), Juncales (9 interviews), Jutiapa (13 interviews) and El Rosario (11 interviews; Table 3-2). In all communities 22 women and 33 men were interviewed. The average age of the interviewees was 47, with ages ranging from 23 to 81 (Table 3-2).

Initial contact was made with a person recommended by AMITIGRA who, depending on the person and community, either organised and set up interviews with community leaders or provided names of leaders or other interested people to initiate snowball selection of interviewees. This form of introduction into the community was important for both identifying and gaining trust of potential interviewees as they were referred to us by a local contact. Additionally, some residents who were not identified as community leaders were also

interviewed opportunistically. All interviews were conducted in Spanish by me and a local field assistant to ensure consistency between interviews and allow for discussion of each interview after the interview was complete (Gray 2004). Conducting interviews in the local language without translation was important for me to fully participate in the interview and allow for probing and additional questions when necessary. All interviews were recorded using a Sony MP3 digital recorder and later transcribed by the research assistant and me.

Table 3-2 Numbers of Interviews and Biographical Information of Residents Interviewed by Community

	Community					Total
	Cofradía	El Carbón	El Rosario	Juncales	Jutiapa	
Number of Interviews	12	10	11	9	13	55
Number of Women	4	5	4	4	5	22
Number of Men	8	5	7	5	8	33
Age Range	23-73	30-81	30-80	29-71	23-74	23-81
Average Age	44	49	47	45	48	47
Community Leaders	10	7	6	5	6	34
Level of Education						
None	2	0	0	0	0	2
Primary (some or complete)	4	8	7	7	7	33
High School (some or complete)	3	2	1	1	4	11
University	2	0	2	0	0	4
Not answered	1	0	1	1	2	5
Land Tenure¹						
Personal or Family Owned	8	6	11	5	7	37
Rented	4	2	0	3	1	10
Cooperative	0	0	0	0	4	4
No land	1	2	0	1	2	6
Average Size of Land (ha) (Owned, Rented and Cooperative)²	17.3 ³ (n=9) (1.8, n=8)	3.2 (n=7)	2.8 (n=11)	1.7 (n=5)	6.9 (n=7)	6.8 (n=39)
Principal Occupation						
Agriculture	3	4	3	4	4	18
Business Owner	1	0	2	1	5	9
Housewife	1	4	0	3	2	10
Retired	1	0	0	0	0	1
Salaried Labour	5	2	6	1	1	15
Student	1	0	0	0	0	1
None	0	0	0	0	1	1
Monthly Income (Lps)⁴						
>5000	3	1	4	0	2	10
4000-4999	1	0	0	0	1	2
3000-3999	2	2	0	0	1	5
2000-2999	3	2	2	2	3	12
1000-1999	1	1	0	1	3	6
0-999	0	4	1	4	2	11
No answer	2	0	3	2	1	8

Notes:

¹ Where an interviewee had more than one type of land tenure it was recorded in both categories and therefore the numbers of interviewees in each land tenure category are not always equal to the total number of interviewees from that community.

² Average size of land only includes sizes of owned, rented and cooperative land. Responses of “no land” or where the size of land was not known were not included.

³ A large property of a single land owner increases the average land size to 17.3 ha. If this land is removed the average land size of the other respondents is 1.8 ha.

⁴ At the time of the study currency conversion was approximately CAD \$1 = 19.8 Lempira

Of the 55 resident interviewees, 34 belonged to a community organisation and self-identified or were identified by others as leaders in the community. Interviews from both community leaders and other residents provided a range of perspectives including those most in touch with the community and resource management as well as residents who were not formally involved in community organisations. Interviews with non-leader residents were also important for ensuring a gender balance in the interviews as many of the identified leaders of community organisations were male.

In all cases we found it important to ensure that the interviewee did not associate us with AMITIGRA or any other affiliate organisation of the community contact or previous interviewee. Statements of confidentiality were important in gaining the confidence of residents during the interview process.

Several trips to each community were made to achieve an adequate sample size to ensure saturation of information in each community and to accommodate schedules of residents available to be interviewed. Depending on the request of the interviewees, trips were made both during the week when interviews were conducted on short breaks from agricultural or other labour activities, as well as on Sundays when people were not involved in agricultural or formal labour activities. This was particularly important in communities where employment outside of the community was common or where agricultural fields were located outside of the residential area of the community.

Interviews were transcribed within a week of being collected. This short time frame was important to capture and synthesize opinions of residents while the interview was still 'fresh'. The research assistant listened to the recorded interview and repeated the words to me, at which time I transcribed the text into Microsoft Office Word. Transcription also allowed me and the

research assistant to discuss each interview and the trends emerging from the interviews on a whole or from a particular community. This was particularly important during the primary stages of interviews to ensure that the desired information was being collected through the interview questions. Ongoing transcription and discussion was also important to ensure that the sample size was large enough to ensure a range of opinions were collected in each community and that saturation of information was achieved (Gray 2004).

Limitations to the survey method that may be relevant to this research include: time needed to obtain a large sample size, survey may not provide as much of a feeling of anonymity compared to other research methods and may result in less honest answers to risky questions (e.g. attitudes towards park management, use of park and resources), risk of inaccurate responses based on perceived or real inter-cultural barriers of communication and/or possible mis-trust and socially desirable responses (Gray 2004). These limitations were mitigated in part by increased survey effort, assurance of anonymity or confidentiality, building rapport with interviewee and by having a local research assistant familiar with cultural conditions and practices.

3.4 Data Organisation and Analysis

Both quantitative and qualitative data analysis were used to make sense of the data. Data were analysed by direct interpretation and descriptive statistics. Data are presented as statistical representations (quantitatively) as well as overall narrative descriptions of themes, personal understanding and comparison with other literature (qualitatively).

QSR NVivo9 (content analysis software) was used to organise the qualitative data. Original Spanish language text was used and no translation of text was done with the exception of segments incorporated into the thesis text. A coding process was used to identify key themes

related to resource conservation and livelihood issues (Auerbach and Silverstein 2003). Coding of data included multiple stages and required four full passes (iterations) through the data:

- 1) Original text from full interview transcripts was coded into to "important", "also important" and "interesting."
- 2) Text in the important, also important and interesting codes were read and coded into repeating ideas.
- 3) Repeating ideas were re-read and re-coded where applicable, this included creating new codes and reclassifying some text into existing codes.
- 4) All interview text was re-read and re-coded into repeating ideas, including adding new text missed in the first round and re-coding text identified in subsequent rounds.
- 5) A few new repeating ideas were identified part way through the fourth round. A search for text related to these specific codes was done and new text was added to the new repeating ideas.
- 6) Each repeating idea was itemised and coded into specific responses. Where an interviewee's response to a specific idea was missing the particular interview was searched and information coded. At this stage the data was quantified where applicable.

Rich descriptions of the relationships of residents to the park, views on benefits and challenges of living in the park and opinions of park administration were written using interview and document data (Robson 1993, Creswell 2003). Direct quotes were used to preserve the voice of residents in the descriptions of results. To choose these excerpts I read through all responses related to a certain theme and chose the responses which best articulated the overall

expression of all responses. I then translated these quotes into English and added them to the document.

Quantitative data analysis was conducted using coded data to describe the data and include comparisons of different groups such as community of residence (Fink and Koseceff 1985, Robson 1993, Gray 2009). Descriptive statistics only included percent of residents with similar responses or percent of residences from each community with a similar response. While sample size was not large enough for determination of significance, descriptive statistics allowed me to identify the prevalence of a certain response or issue in the communities.

Using both qualitative and quantitative analysis helped me understand the relationship of park residents to the park and its management and the key issues related to resource conservation and community development by providing both numerical relationships and an overall understanding based on qualitative methods.

3.5 Ethical Considerations

Ethical considerations were taken into account during the interview process. A written consent form was provided to the management key informants prior to the interviews. This gave the participants time to review the form and fully understand the terms, purpose and process of the interviews. Preceding each interview, the participant was asked if they have any questions, or if they require clarification regarding any details contained within the consent form. Only after the consent form has been signed did the interview proceed. Participants are reported confidentially throughout the thesis with generalized position titles (e.g. a manager) and institution. No matter the extent of anonymity or confidentiality, it may be possible to identify

the contributions of individual participants. This risk is mitigated by the fact that risks incurred are similar to those encountered by the participants in their everyday professional life;

Verbal consent was obtained for resident interviews. Verbal consent was considered appropriate for this context because of possible illiteracy and potential mistrust of written documents and consent. The informed consent document was read to the participant before the interview and the participant was asked if they have any questions or require clarification regarding any details in the consent script. Where requested, a copy of the consent document signed by me and the field assistant was given to the interviewee. Participants are cited confidentially to protect the participant's privacy and protect the identity of people whose answers may put them at risk (eg. illegal activities, conflict with park management).

Confidentiality was addressed during data collection, data analysis and dissemination (Kaiser 2009). During data collection anonymity was described to the interviewee and a verbal consent was obtained. During data analysis and reporting a number was assigned to each participant to protect their identity. During dissemination analysis was done in aggregate for quantitative analysis and for included quotes care was taken to determine what other aspects of a person's stories or circumstances needed to be changed to maintain confidentiality without changing the meaning of the data (Kaiser 2009). If this could not be done some specific data remained unpublished to reduce the chance of deductive disclosure (Kaiser 2009).

3.6 Validity and Data Verification

The most important potential threats to validity are biases of key informants and residents. Researcher bias such as missing relationships or seeing relationships where they don't exist or preconceived notions of what the issues and benefits are may cause threats to validity. A

lack of generalizability may also threaten validity. Several approaches were used to demonstrate validity of the research (Robson 1993, Creswell 2003). Approaches include:

- Triangulation of different data sources of data (documents, key informant interviews, resident interviews).
- Articulation of the bias of the researcher (previous relationships with AMITIGRA and community members).
- Prolonged time in the field to ensure and in-depth understanding of the context and interpretation of data (3 months field research plus 18 months previous experience).
- Development of interviews and of interview techniques to collect desired information including building rapport and trust, designing interviews that contain questions drawn from the literature, and using prompts during interviews to illustrate and expand on initial responses to ensure issues are explored in depth.
- Peer debriefing to enhance the accuracy of the descriptions and presentation of data.
- Presentation of discrepant or contrary information.
- Adequate sample size to ensure saturation of the data.
- Detailed descriptions of the focus of the study, the researchers role, informant selection and context to allow enough information to determine the applicability of the study to another setting.

By employing these approaches issues of confidence, applicability, consistency and neutrality were addressed.

Chapter Four: Management of La Tigra National Park

4.1 Introduction

In this chapter I provide a context for the study by describing La Tigra National Park (LTNP) and how the park is managed. I also discuss results related to the strengths and weaknesses of park management as well as some of the successes of park plans and programs as expressed by managers. Information in this chapter is largely based on review of Fundación Amigos de La Tigra (AMITIGRA) operational documents and key informant interviews.

4.2 La Tigra National Park

LTNP, located in the highlands of central Honduras (Figure 4-1), is an important area for conservation of water, soil and tropical forest resources. The park is located in the San Juancito Mountains, in the department of Francisco Morazán, 24 km northeast of the capital city of Tegucigalpa (14°13', 87°04'). The park is situated in four municipalities: Distrito Central, Valle de Ángeles, Santa Lucia and San Juan de Flores. The topography of the park is mountainous and elevation ranges from 680 m.a.s.l. to 2290 m.a.s.l. Northeast winds, which bring humid air from the Atlantic coast, and the northwest winds of Honduras cause pluvial precipitation in the mountainous areas of the park. Two seasons exist, the dry season from November to May and the wet season from May to October. The average annual precipitation is 1482 mm; however, precipitation varies across the park. Mean annual temperatures vary between 14°C in the highest areas to and 23°C in the lower areas.

In accordance with the Holdridge (1947) system of ecosystem classification, the park contains three ecozones: very wet subtropical lower montane forest, wet subtropical lower montane forest and wet subtropical forest. The area is high in biodiversity and includes broadleaf

cloud forest (dominated by *Quercus skinneri*, *Quercus oleoides*, *Clethra macrophilla*, *Vismia mexicana* and *Inga* spp.), mixed forest (dominated by *Pinus oocarpa*, *Pinus pseudostrobus* and various species of *Quercus* spp.) and pine forest (dominated by *Pinus oocarpa* and *Pinus pseudostrobus*) (Eco-Servisa 1998). Two thirds of the forest in the core zone is of second growth forest due to the activities of the New York and El Rosario Mining Company who operated a gold and silver mine from 1879 to 1954 (see section 4.3). Only the highest elevations of the San Juancito, Cerros de Peña Andino and El Volcán mountains retain primary forest cover. The area provides habitat for many species of management concern and endemic species including six species of vegetation included under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Additionally 17 wildlife species listed under CITES can be found in the park (Table 4-1). Of these 17 species, two are listed as Near Threatened and one species is listed as Vulnerable by the International Union for Conservation of Nature (IUCN) (AMITIGRA 2006).

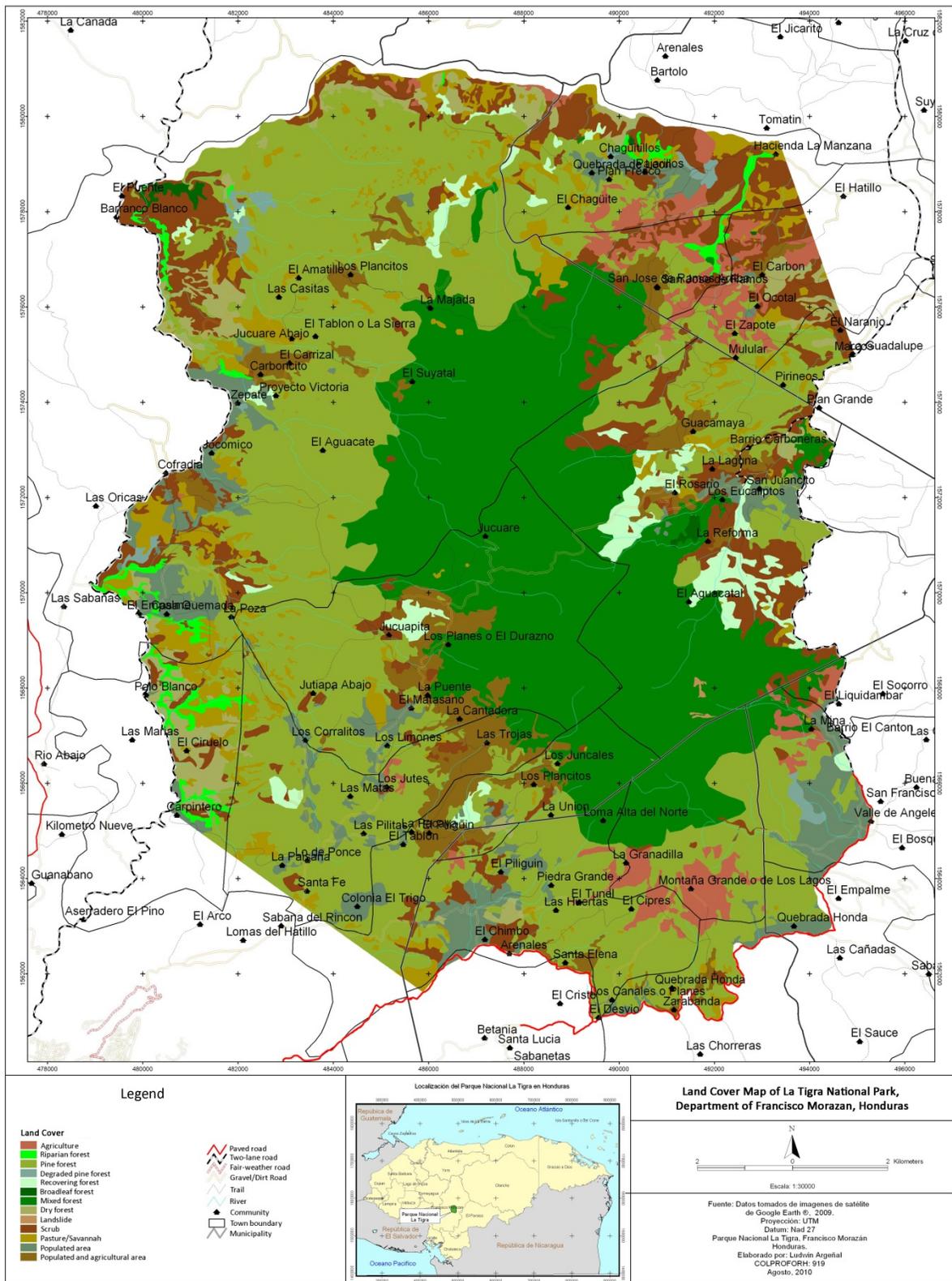


Figure 4-1 La Tigra National Park, Honduras

Table 4-1 Species Listed Under CITES and IUCN Observed in La Tigra National Park

Common Name ¹	Latin Name	IUCN ²	CITES ³
Vegetation Species			
-	<i>Cyathea salvinii</i>	-	Appendix II
-	<i>Cyathea valdecrenata</i>	-	Appendix II
-	<i>Cyathea divergens</i>	-	Appendix II
-	<i>Cyathea schiedeana</i>	-	Appendix II
-	<i>Dicksonia gigantea</i>	-	Appendix II
-	<i>Tillandsia spp.</i>	-	Appendix II
Wildlife Species			
Central American Puma	<i>Puma concolor</i>	Least Concern	Appendix I
Margay	<i>Leopardus wiedii</i>	Near Threatened	Appendix I
Jaguarundi	<i>Puma yagouaroundi</i>	Least Concern	Appendix I
Collared Peccary	<i>Pecari tajacu</i>	Least Concern	Appendix II
Deppe's Squirrel	<i>Sciurus deppei</i>	Least Concern	Appendix III
Mexican Tree Porcupine	<i>Sphiggurus mexicanus</i>	Least Concern	Appendix III
Spotted Paca	<i>Cuniculus paca</i>	Least Concern	Appendix III
Central American Agouti	<i>Dasyprocta punctata</i>	Least Concern	Appendix III
White-nosed Coati	<i>Nasua narica</i>	Least Concern	Appendix III
Kinkajou	<i>Potos flavus</i>	Least Concern	Appendix III
White-tailed Deer	<i>Odocoileus virginianus</i>	Least Concern	Appendix III
Resplendent Quetzal	<i>Pharomachrus mocinno</i>	Near Threatened	Appendix I
Plain Chachalaca	<i>Ortalis vetula</i>	Least Concern	Appendix III
Great Curassow	<i>Crax rubra</i>	Vulnerable	Appendix III
Crested Guan	<i>Penelope purpurascens</i>	Least Concern	Appendix III
Central American Coral Snake	<i>Micrurus nigrocinctus</i>	-	Appendix III
Neotropical Rattlesnake	<i>Crotalus durissus</i>	Least Concern	Appendix III
¹ (AMITIGRA 2006)			
² (IUCN 2012)			
³ (CITES 2012)			

Several creeks and streams originate in La Tigra and 23 small permanent dams maintained by the National Autonomous Service for Aqueducts and Sewers (SANAA) provide 40 percent of the water used in the capital city of Tegucigalpa and 100 percent of the water used by the surrounding communities.

LTNP is composed of a core zone (7,671 ha) of relatively intact cloud forest and a buffer zone (16,469 ha) where some human land uses are permitted. These zones have recently been subdivided for finer scale management. The core zone includes a sub-zone of absolute

conservation and sub-zone of recuperation. The buffer zone has been divided into a sub-zone of intensive management and a sub-zone of extensive management. This zoning has not been implemented on the ground.

Tourism infrastructure exists at the two main entrances to the park in the communities of El Rosario and Jutiapa. Each side has a visitors centre, hostel and park guards employed to conduct fire and enforcement patrols and act as tour guides. A system of trails is maintained through the core zone of the park. Due to the proximity to the capital city, LTNP receives both national and international tourism with most of the visitors entering via Jutiapa. An average of 8,458 people visit LTNP per year (Maldonado and Montagnini 2005). Tourism is currently the only self-sustaining activity conducted in the park with net revenue generation of approximately \$10,000 per year helping to support AMITIGRA (AMITIGRA 2005). Development of a secondary tourism industry in the communities is minimal.

Ninety two communities are within the core and buffer zones of LTNP. Although a census of the communities in the buffer zone has not been conducted, it is estimated that 1,150 people live in four communities within the core zone (AMITIGRA 2006). There is no current census of the buffer zone; however, a 1995 census estimated 4,421 inhabitants (AMITIGRA n.d.). The population of the buffer zone has likely increased dramatically since then. Human land uses in both zones include habitations, cultivated areas, pastures and roads (Eco-Servisa 1998). Cultivation of land is largely for subsistence products such as maize and beans but also includes fruits, vegetables, coffee and flowers. Almost 60 percent of adults in the core zone report their occupation as housewife and another 35 percent as agriculturalists. Communities rely on resources in the park for subsistence and commercial use (both legally and illegally). Resources used include land for cultivation, water for consumption and irrigation, wood for fuel

and construction, earth for mud bricks, plants for medicines and source of income (largely mosses, ferns and epiphytes) and animals for hunting and pet trade.

The principal goal of LTNP is “Ecological conservation and preservation of the hydrological potential of La Tigra National Park for the benefit of the Capital and neighbouring municipalities” (Decree 976). This goal includes a number of specific objectives:

- Preserve the potential of the area as a source of water for the capital city, villages and adjacent hamlets.
- Conserve the features of the forest, maintain the integrity of the flora and restore affected areas while protecting the natural beauty of the surrounding areas in the buffer zone.
- Conserve and foster the resident and migratory fauna of the park.
- Conserve the genetic resources of the ecosystems with their particular geology and topography.
- Offer aid to the development of the neighbouring municipalities, incorporating them in tourism development of the park.
- Provide controlled recreation opportunities to the public, focussed on environmental education.
- Provide opportunities for the development of environmental education programs in and out of the park.
- Serve as a pilot park for the training of personnel that will move on to work in the national protected areas system

Article 4 of Decree 976 which legally declares the park also outlines a number of prohibitions in the park:

- Cut trees and extract products derived from the flora.
- Capture live or dead wild animals and collect or extract any of their products or derivatives.
- Collect or extract mineral rocks, fossils or other geological product.
- Collect or extract objects that form part of the natural and cultural resources of the park, of prehistoric, historic or archeological interest.
- Whatever other activity contrary to the objectives of the park established in the Laws of the country and in the master plan of La Tigra National Park.

The Forest Law (Executive Agreement No. 031-2010) outlines that extraction of natural resources from the buffer zone of a protected area may take place with authorisation from ICF. In effect, residents are allowed to collect dead, fallen wood for domestic use but require a permit from ICF to cut live or dead trees or extract other forest resources.

4.3 History of La Tigra National Park

The region surrounding LTNP has been exploited for mineral resources on a small scale since before the arrival of the Spanish. These operations increased significantly in 1877 when concessions for the mining rights in the San Juancito Mountains were given to the New York and Honduras Rosario Mining Company, owned by American businessmen. Operations began in 1879 marking the opening of the country to foreign investment. By 1920, at the peak of operations, over three thousand miners lived and worked in the area. The economic importance of the area was such that the first American consulate was located in El Rosario, the onsite town

for American and foreign mine managers, and the first hydroelectric plant in Honduras was built in San Juancito. Particularly in the early years of operation, mine managers encountered conflicts with local residents including competition with nearby residents for land and other scarce natural resources such as timber, water, and limestone on private and common lands. The mining activities in the area required wood for the construction of support beams in the mine shafts, construction of houses and operational building, firewood and coal production. Eventually the company deforested the entire east face of the San Juancito Mountain and drilled a tunnel all the way through the mountain to reach primary forests on the west side (Finney 1979). To mitigate these conflicts the government created law enforcement policies and tax exemptions which greatly favored the rights of the Company over local peoples (Finney 1979). During their operation, the Rosario mines were considered to be some of the greatest mines of the Western Hemisphere and produced more than \$100,000,000 from slightly less than 6,500,000 tons of ore (Finney 1979). In 1954, after 75 years of exploitation of the mountains' natural resources, the New York and Honduras Rosario Mining Company ceased operations leaving the hydroelectric plant and the buildings of El Rosario to the Honduran government.

Despite extensive resource exploitation, the environmental importance of the area was first recognised in the 1930s and 1940s when dams and aqueducts were installed to supply water to the capital city of Tegucigalpa. The government of the time recognised the need to protect the quality and quantity of water from these aqueducts through retention of natural vegetation. This recognition became official in 1952 (Agreement No. 12) when the two areas of San Juancito-Picacho (5,472 ha) and El Carrizal (2,033 ha) were declared Protected Forest Zones. In 1971 the protection was strengthened by declaration of both areas as Forest Reserve Zone in the category of Inalienable Public Forests. La Tigra National Park was established in 1980 (Decree No. 976-

80) as the first national park in the country with the aim of acting as a pilot project to gain experience in park management for further replication in the future. The park included the area previously designated as the Forest Reserve Zone as the core zone and a buffer zone surrounding this area was added to reinforce its protection. La Tigra National Park was created with the objectives of conserving the quantity and quality of water, protecting biodiversity and creating opportunities for environmental education. The buffer zone was created to encourage local protection of the core zone. Objectives of buffer zones are often unclear and there is no clear definition or single purpose for buffer zones. The literature identifies two main views on the creation of buffer zones: 1) buffer zone as an extension of the protected area established to protect the area from outside pressures, and 2) buffer zone as integration of parks and people established to extend the benefits of the protected area to surrounding communities (Martino 2001). Although many buffer zones include aspects of both views, most buffer zones are established with the goal defusing local opposition to the protected area (Martino 2001).

The management of LTNP was originally under the responsibility of the Department of Wildlife in the Department of Natural Renewable Resources (RENARE) in coordination with the SANAA, which is the government institution that manages water resources. The first management plan was developed in 1978 as the primary document to guide the management of the park; however, little actual management of the park was implemented and substantial agricultural advancement and forest loss occurred in both the core and buffer zones.

With the official creation of the National System of Protected Areas of Honduras (SINAPH) in 1993 and the provisions for co-management provided for through the General Environmental Law (Decree No. 104-93, Article 36) the newly created NGO, 'Fundación Amigos de La Tigra' (AMITIGRA), solicited the Sovereign National Congress for the

responsibility of administration and management of LTNP. This was granted under Decree 153-93 on the 25 June 1994. At this time SANAA withdrew their forest guards, leaving only those responsible for guarding and maintaining the reservoirs and aqueducts for the capital city, however their user rights to the water resources continue.

4.4 Current Management of La Tigra National Park

Perceptions of poor management of resources and lack of financial support from government agencies, prompted AMITIGRA to solicit the presidential decree which shifted management responsibility for the park to the NGO with approval of the state Forest Conservation Institute (ICF). This system of co-management by decree creates a system of nested co-management (Carlsson and Berkes 2005) where the state agency ICF holds the legal authority to the park and its resources (although much of the land itself is privately held) and other actors, in this case AMITIGRA, are entrusted with the management and administration of the park. In this agreement, the government and AMITIGRA share authority and responsibility for enforcement of legal aspects of management and AMITIGRA is responsible for the daily administration. In 2006 a new management plan, replacing the 1978 plan, was written to include some community consultation in the process. This management plan not only focuses on water resources, but also acknowledges the park's role in maintenance of the local microclimate, production of oxygen, carbon dioxide fixation, ecotourism benefits, esthetic beauty and ecosystem services for the local communities.

A summary of the responsibilities or objectives of AMITIGRA as defined by the Statutes of The Fundación Amigos de La Tigra (Executive Power 186-93) are:

- Maintain unharmed the potential of the core zone of the park as the principle source of generation and supply of water for the capital and neighbouring municipalities.
- Conserve the features of the forest, maintaining the base of its resources and restoring the affected areas while at the same time protecting the natural beauty of the surrounding area including the buffer zone.
- Protect and conserve the resident and migratory fauna of the park and the genetic resources of the ecosystems with their particular geologies with the result of using them to develop ecotourism.
- Offer help and, in coordination with other institutions, drive the development of the neighbouring municipalities.
- Conduct ecological research.
- Promote and organise environmental education projects in the buffer zone.
- Fulfil whatever other type of activity, permitted under the law, that contributes to the completion of the objectives of the Foundation particularly those which have to do with resource protection and rural development.

Although the management plan and Statutes outline key objectives for the park and AMITIGRA, external and internal threats exists which compromise the completion of these objectives. The main threats to the park, as identified through review of AMITIGA operational documents and key informant interviews, are:

- Forest fires and agricultural burning.
- Increases in the area of land used for agriculture.

- Increasing urbanization into the buffer zone.
- Private property within the park, particularly in the core zone.
- Deforestation and deterioration of park resources.
- Increase of demand for public services, particularly water.
- Increasing populations.
- Poaching.
- Impacts of recreation.
- Lack of consultation with communities when the park was established.
- Lack of environmental education.
- Lack of appreciation of the park and its benefits by the local communities.
- Excessive use of agro-chemicals.
- Poor use of resources.
- Poor application of the law.

Although the majority of these issues identified as threats are related to natural resource conservation, managers also recognised livelihood restrictions and lack of community involvement in park management as problems for park residents.

AMITIGRA receives minimal government funding through the Ministry of Natural Resources and Environment (SERNA) and no compensation from SANAA (although a payment for environmental services plan is proposed) and therefore relies on other national and international funding. Through these funds, a variety of projects and programs have been implemented by AMITIGRA in the park to help achieve their objectives. Programs include: improvement of the water supply to communities, promotion of basic sanitation, improvement of

agroforestry activities, reforestation, control of forest fires and forest diseases, building of greenhouses for flower production, building of fuel efficient stoves and environmental education. Despite the many objectives of AMITIGRA and intermittent projects, managers indicate that the majority of their time and money is spent on forest protection through watches and control of forest fires and law enforcement by park guards.

4.4.1 Co-management in La Tigra National Park

Co-management is generally defined in the literature as the sharing of power and responsibility for management of natural resources between the public and private stakeholders (Carlsson and Berkes 2005). In practice, however, there is significant variability in the actual implementation of shared management (Carlsson and Berkes 2005). Although many actors may be involved in management and use of protected areas, it is increasingly recognised that people that live in and use lands and resources within protected areas should be considered as primary stakeholders in decision-making processes (Borrini-Feyerabend et al. 2004, Plummer and Fitzgibbon 2004, Carlsson and Berkes 2005, Jimenez-Castro 2008). The IUCN defines a Co-managed Protected Area as a:

Government-designated protected area where decision making power, responsibility and accountability are shared between governmental agencies and other stakeholders, in particular the indigenous peoples and local and mobile communities that depend on that area culturally and/or for their livelihoods (Borrini-Feyerabend et al. 2004).

Participation in protected areas management is needed to allow for programs that are appropriate to the local culture and context, meet local needs, keep people informed of plans and activities, give people the opportunity to influence decisions and develop long-term sustained

goals (Borrini-Feyerabend et al. 2004, Plummer and Fitzgibbon 2004, Carlsson and Berkes 2005). There are many models of collaboration which outline different scales or levels of participation according to the degree of involvement and empowerment. Borrini-Feyerabend (1996) outlines seven levels of collaboration in protected areas management:

- 1) Ignore the interests and capacities of other stakeholders and minimize their relationship with the protected area.
- 2) Inform the stakeholders about relevant issues and decisions.
- 3) Actively consult stakeholders about such issues and decisions.
- 4) Seek their consensus.
- 5) Negotiate with them on an open basis (thus effectively involving them in the decision-making process) and develop a specific agreement.
- 6) Share with them the authority and responsibilities in a formal way.
- 7) Transfer some or all authority and responsibility to one or more stakeholders.

This model is presented as a continuum of collaboration spanning a variety of ways in which the agency in charge and/or other stakeholders develop and implement a management plan depending on the context and desired outcomes (Borrini-Feyerabend 1996). Scales of participation are a simple and effective way of visualizing participation and collaboration of stakeholders and serve to guide conservation and development programs. However, the use of scales as the only mechanism to guide practitioners is cautioned, as high participation levels do not necessarily imply better practices. These scales also do not include assessment of equity of participation (i.e. who is participating) (Chambers 2005). An organisation may sit anywhere on

the continuum and adapt ladders to fit particular contexts or use different ways of collaboration for different aspects of management (Chambers 2005).

In Central America, many institutions, both government and private are managing systems of protected areas in parallel with government efforts using a variety of management methods and levels of participation (McNeely et al. 1994). With the creation of SINAPH, co-management of Honduran protected areas was defined, including a condition that a management plan must be developed and approved by State Forestry Administration-Honduran Forest Development Corporation (AFE-COHDEFOR; now ICF) (AFE-COHDEFOR/IUCN 2006). There has been little regulation or enforcement of these conditions (AFE-COHDEFOR/IUCN 2006). In 2005, the administration of 44 of the 102 protected areas in Honduras was jointly managed through 27 co-management agreements of various forms (Vreugdenhil X et al. 2002, AFE-COHDEFOR/IUCN 2006). Diverse sectors are involved in co-management of protected areas in Honduras including local governments, civil society, environmental NGOs and private institutions (AFE-COHDEFOR/IUCN 2006). Local NGOs are involved in the management of more than twenty of the areas (Vreugdenhil X et al. 2002). Four of these areas are managed under Federal Decree and the rest have renewable five year co-management agreements. In the majority of cases, the co-management agreement outlines the rights and responsibilities of both parties (AFE-COHDEFOR/IUCN 2006). As previously described, LTNP is managed through decree between ICF and AMITIGRA. This federal decree is less explicit about shared and state responsibilities than the co-management agreements and provides only general responsibilities for the delegated NGO and government.

I examined co-management in the case of La Tigra National Park and how this particular structure works from the perspective the key stakeholders (government, NGO and communities

within the park boundaries). Both strengths and weaknesses were expressed by managers regarding the sharing of responsibilities and success of the agreement. Perceived strengths of the agreement are:

- The legal decree allows for long term management, creation of good working relationships between government and NGO staff and potential to develop relationships with residents.
- Delegation of management to the NGO allows for external funding opportunities and conservation and development of the park, not possible in federally managed protected areas.
- External evaluation of management activities by ICF creates accountability and possibility for improvement.

Perceived weaknesses were expressed as:

- Lack of well-defined roles for each key stakeholder creates disproportionate responsibility and lack of accountability of ICF to fulfill financial, technical and administrative obligations.
- No forum exists to resolve different management priorities of key stakeholders.
- ICF is detached from daily management and is therefore unaware of key issues in LTNP.
- Lack of meaningful participation by resident communities creates issues related to land and resource use and land rights.

- Absence of ICF in daily management creates confusion in the communities related to authority of AMITIGRA. AMITIGRA is seen as having more power than ICF and perceived as private interest with control of public resources.

Under this model of nested co-management between ICF and AMITIGRA, key stakeholders in LTNP are not equally involved in governance and decision making in LTNP. Resident communities are not part of the formal co-management agreement but are included as participants as part of the park management plan. Because of the comparative informality this system, the mechanisms for the participation of residents in the management of protected areas are not well defined and largely involve informing or consulting with no mechanism for ensuring community concerns are actually integrated into management. This system of co-management also relates to the “parks and people” issue of non-local interests dominating over local concerns. An NGO, in this case AMITIGRA, is not an elected body and this type of system constitutes a delegation of tasks from government without the necessary accountability to the local populations (Ferroukhi 2003, Timms 2011).

The weaknesses of co-management identified by key stakeholders in LTNP are common across co-managed areas in Honduras (AFE-COHDEFOR/IUCN 2006). The IUCN recognises that Honduran regulations regarding co-management agreements are not as clear and specific as they should be (AFE-COHDEFOR/IUCN 2006). It is also maintained that participation of municipalities and local governments is low due to little or no government funding and lack of coordination between government agencies (Jimenez-Castro 2008). This lack of funding is also identified as limiting technical involvement capacity for management of protected areas and enforcement of regulations (Harborne et al. 2001, Jimenez-Castro 2008). Mechanisms for the participation of local people in the management of protected areas are not well defined in the

existing laws and regulations allowing for discretion on the part of the NGO to how and how much involvement is necessary (Vreugdenhil X et al. 2002, Jimenez-Castro 2008). Jimenez-Castro (2008) also found that the participation of government agencies in co-management of a marine protected area in Honduras was minimal to the point they were often not informed or consulted on significant matters.

4.5 Management Successes and Problems in LTNP

Since 2000, ICF has instituted a system of evaluation of protected areas under SINAPH and to date has conducted 98 evaluations in 34 protected areas. The most recent evaluation of LTNP was conducted in March 2011 between ICF and AMITIGRA with participation of various community representatives, leaders of municipal governments and representatives of the Municipal Environmental Units (ICF 2011). This system of evaluation employs 35 indicators in five categories: social, administrative, natural and cultural resource management, political-legal and economic-financial. LTNP was evaluated as “Satisfactory,” the highest category of evaluation. A closer look at the social category shows four indicators contributed to the Satisfactory evaluation in this aspect of management:

- Communication and disclosure plan in execution and evaluated: a number of actions are taken towards communication and disclosure including a systematic study of the population and radio and television coverage aimed at educating the public in the importance of the park.
- Participation of interest groups: a municipal involvement act and agreements with organisations exist, and land agreement with the community of Valle de Ángeles has been signed.

- Land tenancy in the protected area: a survey of private land has been conducted in the core zone but is lacking in the buffer zone.
- Environmental education plan in the protected area: an environmental education plan exists and an education plan is being developed with a post-secondary institution.

Related to natural and cultural resource management the evaluation mentions are:

- Protection and surveillance of natural resources have decreased impacts in the park.
- A database of information and published literature related to park resources has been developed and various vegetation and wildlife studies have been completed.

Weaknesses in this category are:

- The loss of 2,000 ha of forest in the core zone due to anthropogenic activities; however, it is mentioned that activities such as inspections by the co-managers of the park (ICF and AMITIGRA), denouncement of illegal activities and patrols by military are being used to mitigate these losses.
- The delimitation and demarcation of the core zone is considered to be a success however this activity is lacking in the buffer zone.
- A research and monitoring program is not in effect and little activity related to species recovery or conservation is implemented.
- Lack of knowledge related to the connectivity of LTNP to other protected areas in the region.

During key informant interviews managers expressed similar successes including:

- Good evaluation of management by ICF.
- Demarcation of core zone.
- Maintenance of infrastructure for tourism.
- Education of communities.
- Coordination with municipal leaders.
- Development of a management plan.
- Zoning of the park map into different management zones.
- Survey of agricultural areas in the core zone.
- Creation of a research sub-program.
- Creation of a financial plan.
- Implementation of community development projects such as fuel efficient stoves, water supply and greenhouses.
- Reforestation of some degraded areas.
- Protection of park resources.

Interestingly, given that in key informant interviews all managers indicated that most time and money were spent on protection of natural resources, the category of natural and cultural resources scored lowest while the social category was scored as highest. The evaluation in both categories as well as managers expressions of successes largely focussed on protection of resources with little consideration for meaningful public involvement beyond education and minor consultation. Although the successes are significant, there seems little motivation on the part of ICF or AMITIGRA for going beyond informing or consulting people (“low” level of

participation), towards collaborating with residents in intensive processes of communication, decision making and common action (“high” level of participation) (Prager 2010).

The successes of management activities were attributed to the knowledge and experiences of AMITIGRA and managers with the area, the communities and the resources, good management of financial resources, acquisition of technologies such as ArcGIS, good technical staff and achievement of financial opportunities such as funding grants. Managers identified obstacles to better management as the lack of political and government support, lack of financial resources, inability to make an impact in the communities and to reduce issues and inadequate, conflicting or poorly implemented laws related to natural resource protection and protected areas.

4.6 Conclusion

LTNP is an interesting example of the dilemma related to parks and people. The ecological and social importance of the area makes it integral for the management system to be relevant for conservation and local livelihoods. Although the management of LTNP by AMITIGRA has allowed for better conservation and development of the park than would be possible through federal management alone, the unbalanced role of the three key stakeholders in the park (ICF, AMITIGRA and residents) creates issues for effectively conserving the area while allowing for local participation. Definitions of responsibilities of each key stakeholder and a formal process for involvement of resident communities are needed to improve the function of this system.

Chapter Five: Results of Residents' Knowledge and Awareness of La Tigra National Park

5.1 Introduction

In this chapter I discuss results of interview questions related to residents' knowledge and awareness of protected areas and conservation of La Tigra National Park (LTNP) in particular.

To understand residents' knowledge and understanding of these topics, I asked residents questions related to knowledge about their environment, and understanding of conservation and the operation of LTNP. This information helps me to better understand the similarities and differences in local conservation and livelihood perspectives and formal conservation priorities.

5.2 Background

There is a great deal of research on local residents' attitudes toward and perceptions of protected areas, but much less research focusing on local residents' knowledge about conservation and protected areas (Olomí-Solà et al. 2012). In order for a protected area to effectively function, a shared understanding between stakeholders of certain basic facts, such as the park's location and boundaries, its purpose, its rules and regulations, and its structure of authority are necessary (Barton 2001). Literature indicates that local people close to protected areas often have relatively high levels of knowledge about the existence of the protected area, but little understanding of its goals and importance (Olomí-Solà et al. 2012). Some studies have shown that understanding of formal conservation and park management can increase support for the park's mission and activities among local residents (Barton 2001). To this end protected areas managers often institute educational programs to inform local residents about the park, its purposes, boundaries, and policies, and to foster a sense of ownership and pride towards the park (Barton 2001, Allendorf et al. 2012). However, Pfeffer et al. (2006) found that higher level of

exposure to environmental knowledge sources did not necessarily translate into attitudes more supportive of environmental preservation. Managers must also implement programs that facilitate active participation of local people and discussions with residents in order to gain an understanding of local contexts, perceptions and values and facilitate joint decisions about how lands within or around protected areas should be managed (Agrawal and Gibson 1999, Brown 2002, Dudley 2008).

It is often assumed that rural people in the developing world are ignorant of conservation issues and opposed to conservation practices; however, many studies show that local people hold ecological values and support conservation activities (Badola 1998, Pfeffer et al. 2001, Gareau 2007, Schelhas and Pfeffer 2009, Allendorf et al. 2012). This is not to say that local people hold ecological worldviews that are identical to that of non-locals, but local values may be compatible with many wide-spread ecological views (Gareau 2007). Exposure to common events such as the spread of environmental values through environmental education produces similarities in environment values while local contexts produce differences (Schelhas and Pfeffer 2005). This suggests that environmental values develop from people's economic, social, cultural, and political experiences and that environmental views are locally constructed within particular contexts (Schelhas and Pfeffer 2009). Values can influence both perceptions and attitudes and therefore examination of perceptions and attitudes to conservation and protected areas can provide information on people's conservation values. Perception can be defined as one's experience in an environment based on information obtained through the senses, the media, and through contact with other people. Attitudes are emotional responses to an object, a person or environment and are influenced by knowledge, perceptions and values (Cisneros 1998, de Albuquerque and de Albuquerque 2005, Vodouhe et al. 2010). Understanding people's

perceptions, attitudes and values is important for incorporating local perspectives and values into the decision-making processes (Vodouhe et al. 2010).

5.3 Results

5.3.1 Changes to the Forest

Deforestation is identified as an environmental concern in Honduras (Schelhas and Pfeffer 2008) and in LTNP by the Fundación Amigos de La Tigra (AMITIGRA) managers due to population growth, agricultural expansion and resource exploitation. In 2006 approximately 12% of the park was classified as traditional agricultural land use and loss of forest due to expansion of agricultural lands is identified by managers as a major threat to the park. However, managers have also conveyed success in reforestation and regeneration in other areas of the park due to protection regulations and reforestation. Therefore it is likely that some areas of the park have increased forest cover and in other areas the forest cover has decreased, but comprehensive land cover and land-use change data would be required to validate this supposition.

Almost all residents interviewed (95%, n=51) identified a change in forest cover in and around their community in their lifetime; however, responses were equivocal in assessing whether forest cover had increased or decreased. Almost half of respondents (49%, n=27) stated that there was more forest now than there used to be and 44% (n=24) stated that there was less forest now than there used to be (Table 5-1). Another four respondents (7%) said that there was no change in amount of forest cover, including one person who stated that although there was no change in her community there were changes in other communities in the park (Table 5-1). These results align with Gareau (2007) who found that 45% of residents of the Honduran

protected area Cerro Guanacuare believed that the area was less forested compared to the past, 39% said it was more forested and 13% believed it was the same as before.

Table 5-1 Perceptions of Change in Forest Cover in LTNP by Community

Community	Less Forest		More Forest		No Change		Total Interviews
	Number of Respondents	Percent Respondents (%)	Number of Respondents	Percent Respondents (%)	Number of Respondents	Percent Respondents (%)	
Cofradía	6	50%	6	50%	0	0%	12
El Carbón	6	60%	4	40%	0	0%	10
El Rosario	2	18%	8	73%	1	9%	11
Juncales	7	78%	1	11%	1	11%	9
Jutiapa	3	23%	8	62%	2	15%	13
Total Interviews	24	44%	27	49%	4	7%	55

In LTNP people over fifty years old were more likely to have noticed an increase in forest cover in their lifetime whereas people under fifty years old were more likely to have noticed a decrease or no change in forest cover (Figure 5-1).

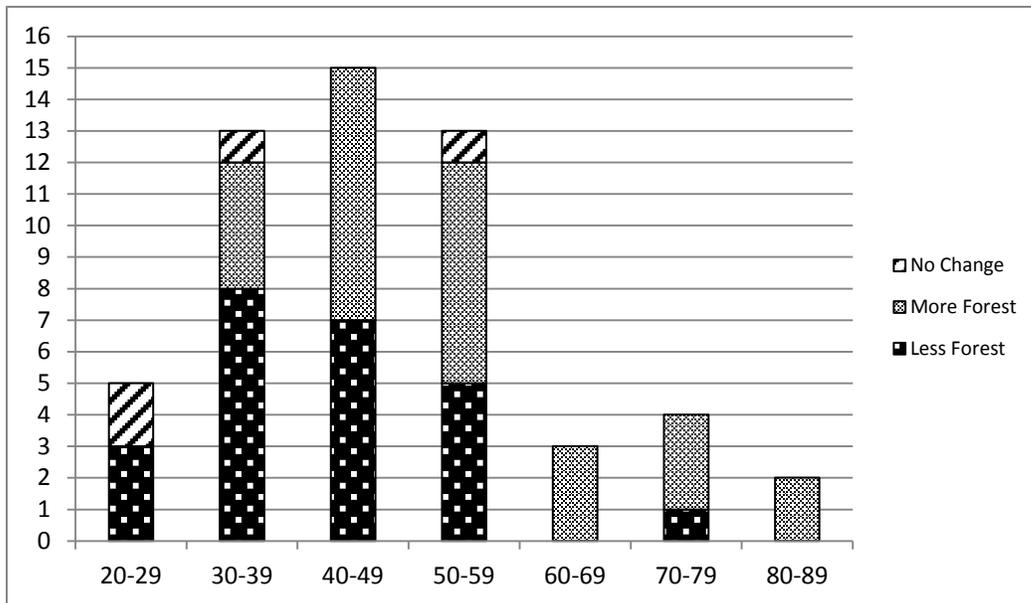


Figure 5-1 Perception of forest change in LTNP by age of respondent

These observations are likely a result of the intense deforestation of the area during the operations of the New York and El Rosario Mining Company until 1954. Protection of the area

of LTNP first occurred in 1952 and therefore it is likely that much regrowth has occurred in the area since this time. This situation is somewhat unique in that many protected areas are primary forest cover. One person expressed this by talking about the old days:

Look, I'm going to explain that here, with the Rosario Company; they took all the wood to Tegucigalpa, for the company, for their boilers that were here. Some sixty mules passed here daily towards the mountain and 60 more passed by with loads of wood and other things for the company to sell. And that is how it has changed. Times are different now. (#109)

More residents of El Carbón (60%) and Juncales (78%) identified a decrease in forest cover, whereas more residents of El Rosario (73%) and Jutiapa (62%) identified an increase in forest cover (Table 5-1). Equal number of residents interviewed in Cofradía (50%) identified a decrease or increase in forest cover (Table 5-1). Residents identified ten reasons for a decrease in forests (Table 5-2).

Table 5-2 Reasons for Decrease in Forest Cover

Reasons for Decrease in Forest Cover	Number of Respondents¹	Percent of Respondents
Fire	10	42%
Resource exploitation	9	38%
Seasonal or natural changes	5	21%
Humans are naturally destructive	4	17%
Agriculture expansion	3	13%
Lack of education	2	8%
Forest disease	1	4%
Lack of personal resources	1	4%
Lack of future planning	1	4%
Population growth	1	4%
¹ n=24		

The most common reasons identified were fire (42%, n=10), resource exploitation (mostly direct tree cutting) (38%, n=9) and seasonal or natural changes (21%, n=5). People also identified humans as inherently destructive, loss from agricultural expansion, lack of education,

forest diseases, lack of personal resources, lack of future planning, and population growth as reasons for a decrease in forest cover.

Similar to results of in Cerro Azual Meambar National Park in Honduras (Schelhas and Pfeffer 2008), residents of LTNP who believed there was less forest expressed regret over loss of forest but attributed it to the ignorance of people. One person expressed this by saying:

It is the result of many factors, firstly, carelessness of people. Second could be bad intentions. Third there are people who act ignorantly. Unfortunately people need firewood and they get the idea to set fire to a green area, the trees dry and they benefit. But they don't know the damage they are doing. They don't know that in the end they are affecting, we could say, the whole world. (#204)

Others expressed the connection between deforestation and local resource needs:

Yes it has changed. Because I remember the forest here was a beautiful forest. It has changed in the aspect that the communities have grown and they need firewood to cook their food. (#308)

When asked what the results of the decrease in forest cover the most common responses were less quantity or reliability of water (42%, n=10) and change in climate/warmer climate (29%, n=7). Residents also mentioned floods and erosion of soil, less rain, no trees, fewer animals, health effects of smoke from burning, less productive land or no results. Residents talked about the results of deforestation in their communities including the changes in water and climate.

Well before, with respect to the climate, it was much colder. Not now. Now the climate, we are talking about almost the same climate as the low areas, below some 900 metres above sea level, now it is almost the same climate. I believe it is because of the immigration of agriculturalists, for the most part the coffee plantations have extended a lot more. And remember that Honduras is exporting lots of coffee and from this area they export high altitude coffee. So I believe because of this, like I said, it is much warmer. And the winters are shorter, much shorter. Soil erosion, a lot of soil erosion. (#510)

And these days there are enormous changes. There is a lot of destruction, there is no sustainability. The climate has changed; the climate has changed a lot. The drinkable water that we have had for years is becoming a bit scarce. (#201)

For those that observed an increase of forest cover, the main reasons given were:

conservation or protection by AMITIGRA or ICF/government (44%, n=12), conservation or enforcement by the community (41%, n=11), existence of regulations (26%, n=7) and a decrease in tree cutting from previous days (22%, n=6; Table 5-3).

Table 5-3 Reasons for Increase in Forest Cover

Reasons for Increase in Forest Cover	Number of Respondents¹	Percent of Respondents
AMITIGRA or government protection	12	44%
Forest is cared for and laws enforced by people in community	11	41%
Cutting is prohibited and permits are difficult to get	7	26%
People don't cut like before	6	22%
No agricultural expansion	5	19%
People don't burn anymore	5	19%
More awareness	4	15%
Reforestation	4	15%
Forest recuperates naturally	4	15%
Emigration	2	7%
¹ n=27		

Other reasons mentioned were: decrease in agricultural expansion, decrease in burning, more awareness in the community, natural recuperation, reforestation and emigration to the city. Residents who observed more forest in their community most often attributed the change to regulations and education by AMITIGRA and more conservation consciousness of the community leading to changing certain practices, such as burning.

I have seen a lot of changes, for example before the forest, for example here in El Rosario, before the forest was burned a lot, but with controlled burns. They were controlled burns. So then the forest was maintained but more reduced. Nowadays, now that experts have come with studies, they have come to educate us; we have participated

in workshops many times. And so we have seen that the forest has gotten bigger and there is more care. (#507)

Another person talked about these influences leading to change by comparing the area under cultivation.

Yes because I remember when I was little all of this was cultivated. There was no forest. These trees that you see here, they weren't here because they cultivated vegetables. Over there, the old man that lived there planted corn. Up there and all of this, there was no forest. Now all of this has reproduced into forest. Well the change is because they have let the forest grow. Because when AMITIGRA came, they conserved things more. Because now one, with these institutions, one respects it now. (#413)

Similar to the perceptions of the results of deforestation, the most common results identified by residents who had noticed an increase in forest cover were more water (41%, n=11) and a cooler climate (15%, n=4). Residents also identified results of more forest as: less land to cultivate, more fresh air, more animals, the park providing a source of income, better availability of wood, the area is more beautiful, there are more trees, better irrigation and harvest and no results. Recuperation of the forest was often linked to increase in water supply:

Well yes, maybe, because if we had continued cutting like they used to, where would our water come from? The water comes from over there, those streams that are there. Before people damaged the streams and so the water dried up. Now no, now we have a bit more water. In that part it is better, because now we have water. In the old times, before, they rationed water in the summer and now no. So this means that this has resolved something. (#202)

Similar results were also found in the Sierra de Huautla Biosphere Reserve in Mexico where 60% of respondents noted deforestation in their areas, attributed to wildfires and the need for agricultural expansion which was perceived to have resulted a change in climate, such as hotter summers and less rain (Durand and Lazos 2008, Durand 2010).

Residents' awareness of the deforestation or recuperation of the forests in their community shows an environmental awareness of the consequences of environmental change.

Although AMITIGRA managers often expressed that residents did not understand their impact on or the results of changes to their environment, it is evident both managers and residents perceive similar environmental changes.

5.3.2 Definition of a Protected Area

The International Union for Conservation of Nature (IUCN) defines a protected area as: “an area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means” and the Convention on Biological Diversity (CBD) defines it as “a geographically defined area which is designated or regulated and managed to achieve specific conservation objectives” (Borrini-Feyerabend et al. 2004). Although slightly different both definitions focus on certain legal or regulatory status for conservation or protection of natural areas.

To gain an understanding of residents’ familiarity with the concept of protected areas I asked each interviewee to define a protected area. Forty-two residents (82%) provided a definition and 9 residents (18%) said they did not know what a protected area was. A range of ideas were talked about in the definitions (Table 5-4) with two main themes standing out as dominant: 1) a protected area as something or somewhere that should be cared for and protected (45%, n=23) and 2) a protected area as an area with restrictions on use of land or resources (33%, n=17).

Table 5-4 Main Themes from Residents' Definitions of Protected Areas

Protected Areas Definition	Number of Respondents¹	Percent of Respondents
An area to care for and protect	23	45%
An area with restrictions	17	33%
An area protected by others	9	18%
To protect something beneficial	9	18%
Forest	5	10%
This is an protected area	3	6%
Somewhere there are animals	2	4%
Don't know	9	18%
¹ n=51. Response missing in four interviews		

Two examples of definitions that mainly focus on caring and protecting an area are presented below.

For me a protected area is an area that we must care for to keep it always beautiful. One must not cut down the forest instead one must always care for it so that it is maintained. (#102)

A protected area is where we care for the fauna and everything that is in the protected area. And so we have all learned that, look, here no one goes out hunting. The deer run freely. You see animals in the mountain and nobody does them any harm because it is a protected area. (#404)

Responses which dealt mainly with restrictions sometimes perceived these regulations as a necessary part of a protected area but they were also sometimes viewed as unnecessarily restrictive.

Well look, here we are in a protected area. Protected is where there are a bunch of limitations. It is where one has to protect, where one cannot cut trees. There are a bunch of situations that you cannot do. And so we, as communities, are informed that we live in a protected area where there are some things that we cannot do and if we are going to do them we have to solicit permission or search out the corresponding entities so that they can give us the opportunity to do them. (#410)

A protected area is that which you cannot use. We are in Honduras. Here a protected area is that which is protected that you cannot go and get a tree, take a bird, use animals that are found there. Well, in few words, human beings are in second place. In the food chain human beings are in the first place. But nowadays no, nowadays we are in second place. First, wild animals live while people die. I'm not saying that wild animals don't

have value, they do, but I believe that it is not right that animals live while humans die. (#212)

Residents that focussed mainly on the restrictions often view the restrictions negatively or as an inconvenience rather than a benefit. However, the concepts of caring for the area and restrictions were not mutually exclusive and some respondents mentioned both in their definition, concentrating on the need for laws and regulations in order to care for these areas.

They are very important areas of our country that are governed by laws. There are laws that permit protection, where one must care for everything that is in the area. They are big areas of forest which have not been touched by people. This is a protected area and there are laws that regulate the use of these areas of the country and, above all else, they generate great quantities of water. (#501)

Thus the restriction on land and resources was not always portrayed as a negative idea but sometimes as a necessary condition for protection. Other concepts that were used in definitions were: an area that is protected by others; an area that is protected for a beneficial resource (e.g. water); a protected area as simply a forest; a place where there are animals; and identification of “this” (LTNP) as a protected area.

The idea of a protected area being an area which produced water, as expressed in the quote above, is consistent with the creation of the protected areas system in Honduras and reflects the management priorities of LTNP in particular which was originally protected to conserve Tegucigalpa’s water supply. A principle element of most Honduran protected areas is the importance of protecting watersheds and water supply. By emphasizing a resource used for human consumption such as water, Honduras likely generates more public support for its protected areas than would be possible through an emphasis on protection of nature or wildlife (Barton 2001). It is therefore reasonable that residents associate conservation of water as a key concept in the definition of a protected area.

The concept of the area being protected by others is interesting given that the majority of respondents identified the community being responsible for protection of forests in the area (see section 5.3.5). This idea was expressed as both the necessity to have someone designated to protect the area and that a protected area was a private resource protected by others.

It is a forest that is protected for something, by someone, by a foundation. Well as I understand it that is a protected area. For example, here there is AMITIGRA and there are people in charge of protecting the forest. (#104)

Yes I know that it is something private that is protected. Not used as a material benefit but as a reserve. (#304)

The definitions provide information on how protection and conservation are perceived by residents. Many of the ideas portrayed in the IUCN and CBD definitions of a protected area and the priorities of the Honduran national parks system were expressed by residents. Not all definitions given by residents included all the concepts in the official definitions and some were very simply portrayed, such as “A protected area is an area that everyone should care for” or “A protected area is to protect the forest.” Despite these simple definitions the ideas expressed show some mutual understanding of managers and local people regarding definition of the area. However, since 18% of respondents were not familiar with the concept of a protected area and said they could not provide a definition and many definitions contained a single idea, this indicates that there is not a complete common understanding of this conservation concept.

5.3.3 Knowledge of Management Zones

Residents’ knowledge of where the limits of the park are is essential to effective park management (Barton 2001). Given that the core zone and buffer zone of LTNP have different management priorities, permitted activities and regulations, understanding by residents of which

area they live in is important in the acceptance of park objectives and to avoid conflicts between residents and park management. Olomí-Solà et al. (2012) also suggest that confusion over boundary location can facilitate illegal use of resources. To see what residents' knowledge of park limits was I asked if they had heard of LTNP and if they knew which zone of the park they lived in.

All residents interviewed had heard of LTNP, but what constituted the park was unclear.

A few respondents mentioned that where they lived was part of the park.

From what I know, La Tigra National Park is situated in this area. Because I have walked through this whole area there and all this part here, they have told us is part of La Tigra National Park. (#110)

However, many residents commented that they did not live in the park, that people were not allowed to live in the park, or that the park was “up there” indicating that the buffer zone is not commonly thought of as part of the park.

Well we can't be there, in something that we are caring for, or go in there. We can go to visit it, to care for it, to plant something, like I said, to go in. To live there, I don't think you can do that. (#101)

No we don't even visit this Tigra, we don't even know what it is like, since I came here to this house at 9 years old and I am 43 years old. (#411)

Well I don't know the park, I live close but I don't know it. I have never gone. (#102)

The uncertainty of whether the buffer zone is part of the park creates ambiguity related to park limitations and regulations in the area. This ambiguity is similar to results found by Barton (2001) where whether buffer zone was considered part of the park was unclear, even among park personnel.

Different management priorities and regulations exist for the core and the buffer zones of LTNP. Residents were asked if they know which zone of the park they lived in, which was

followed up by prompting of core, buffer or outside the park if the question was not understood or if there was uncertainty as to whether the community was part of the park. Only 51% (n=27) responded correctly to living in either the core or buffer zone respectively (Table 5-5; Figure 5-2).

Table 5-5 Zone of Residence in LTNP by Community

Community	Correct Zone	Incorrect Zone	Don't Know	Unknown ²	Total Interviews ¹
Cofradía	6	3	3	0	12
El Carbón	4	0	5	0	9
El Rosario	8	3	0	0	11
Juncales	4	2	3	0	9
Jutiapa	5	4	2	1	12
Total Interviews¹	27	12	13	1	53
Percent of Total Interviews	51%	23%	25%	2%	N/A

¹n=53. Response missing in two interviews
²The actual zone of residence of one respondent was not determined

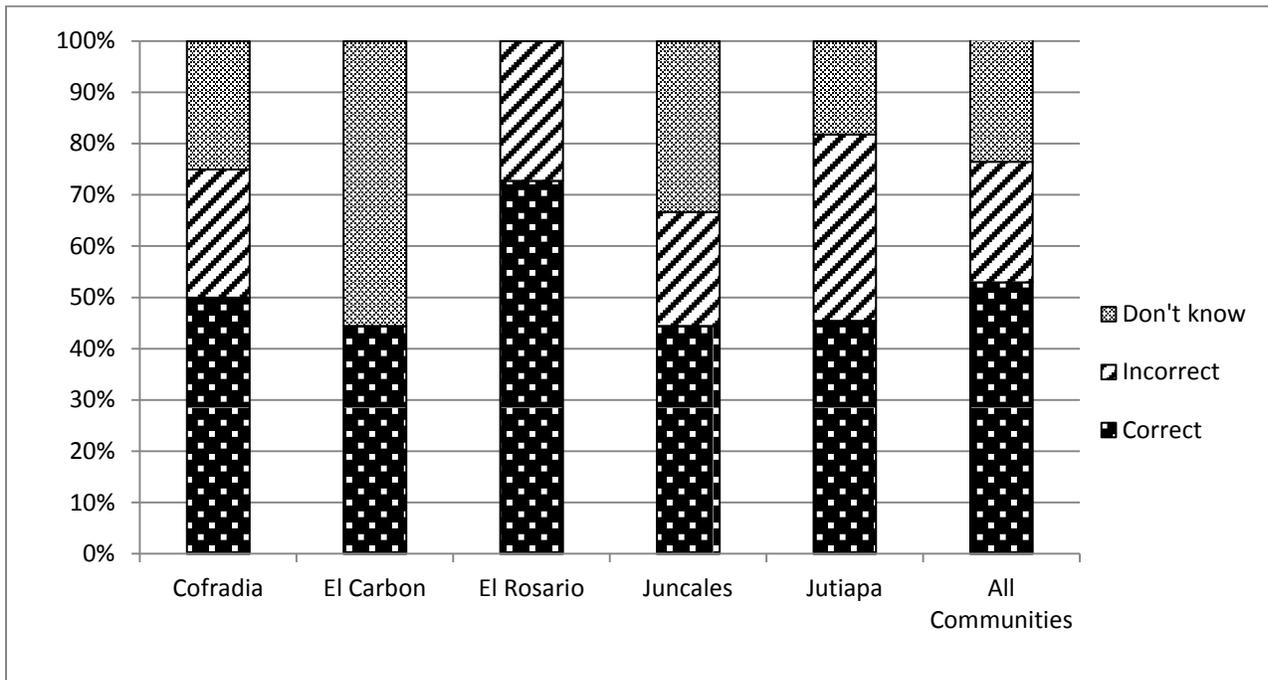


Figure 5-2 Knowledge of Zone of Residence by Community

Twenty-three percent (n=12) of residents responded incorrectly as living in either the core or the buffer zone when in reality they lived in the other zone, including two people who indicated they did not live in either zone but outside the park. Twenty-five percent (n=13) residents responded that they did not know which zone they lived in. In total 48% of respondents did not know which zone they actually lived in.

This issue is further complicated by the fact that in two communities (Jutiapa, and El Rosario) there are residences in both the core and buffer zones and on the ground delimitation has not been completed in most areas. Interestingly despite being on the border of the two zones, respondents in El Rosario (73%) responded correctly more than people in other communities (Figure 5-2). Another complication is the history of Juncales, which was originally located in the core zone and was relocated to the buffer zone when it was rebuilt in 1998 after it was destroyed by Hurricane Mitch. Despite the relocation of the houses, much of the agricultural lands of the relocated residents remain in the core zone and continue to be cultivated. Less than half of people interviewed in Juncales (44%) knew which zone they lived in.

This ambiguity on zone boundaries has also created some problems in the communities as residents perceive that AMITIGRA is expanding the core zone as they mark the zone limitations on the ground or mark the limits of the current agricultural areas for inclusion in recently created sub-zones. The start of delimitation of the zones on the ground is one of the program goals in the management plan which was mentioned by all managers as management achievement. However, this marking of the zone boundaries was also mentioned by both managers and residents as a source of conflict. Residents expressed the confusion over the demarcation of the agricultural areas and of the core zone:

Now in reality I don't know because I haven't investigated. It is inside. Before it wasn't inside, it used to be in the buffer zone, Cofradía. But now it practically falls in the core zone. I don't know if they have made a new decree, I have to investigate that with a lawyer, but it harms us. Yes in those times they wanted to remove us so that we were not within the core zone, or I should say that they are going to remove us. The people haven't thought about this but you know that they make laws concealed from one, the decrees the state makes, decrees disregarding people. And so to me it seems that these borders that they have put there are practically saying that we are inside the core zone. This is what I understand. (#212)

And the core zone is apparently where the street is, you came from there, from where there is a curve, Cantadora they call it. From there to here all the mountain above is the core zone. But now the matter stands that from here supposedly is the buffer zone. But the buffer zone is lower. (#404)

Listen, I think that I live in the core zone but I believe that the limits they have made, they made closer to here without respecting private property. (#412)

Managers also talked about the conflict:

Yes, because well, in Jutiapa we reached an agreement with the Water Committee and they told us that we could immediately begin the demarcation of the agricultural zone. And so we programmed the work and when we started we made the first segment of the area that is the middle part of the watershed that supports Jutiapa. And when we finished there, waiting for us, was a group with machetes and everything, from there, from the community. We had the documentation with us and we showed it to them and they told us no, that we couldn't go in there. And so actions that are oriented towards improving the conditions of the community are opposed in part by one of the groups and that generates conflict. (KI-B)

The relatively poor knowledge of the limits of the core zone and the zone of residence by almost half of the respondents creates problems for effective management of the area and increases the potential of illegal use of resources.

5.3.4 Reasons for Existence of the Park

One of the most important concepts for creating a shared understandings between park management and residents is the reason for the existence of the park (Barton 2001). The

literature related to people and parks indicates that local people often do not know the reasons for a parks existence (Barton 2001, Rao et al. 2003, Alkan et al. 2009, Ferreira and Freire 2009, Durand 2010, Olomí-Solà et al. 2012). Understanding of this basic information by all stakeholders is crucial for effective management of a park's resources and for gaining support of local people for conservation objectives (Barton 2001).

The reasons for the creation of LTNP are articulated through its objectives (see section 4.2). In key informant interviews managers mentioned eight objectives of the park in both the question related to the objectives of the park and the question related to objectives of AMITIGRA. All of the managers stated conservation of water resources as an objective and three of the four managers stated protection of natural vegetation. All of the objectives outlined in Decree 976 as park objectives were mentioned by at least one manager, with the exception of conservation of resident and migratory fauna. This is not to say that managers are unfamiliar with park objectives; however, conservation of vegetation for the purpose of protecting the water supply is the priority for the creation of the park and the focus of much of AMITIGRA's activities.

To gain an understanding of residents' knowledge of the purpose of the park, I asked residents why or for what reasons the park existed. Seventy-eight percent of residents interviewed (n=39) gave at least one reason for the existence of the park and 22% (n=11) said they did not know why the park existed (Table 5-6). Most people understood that the park was created to protect the forest or natural resources. The most common reasons given for the existence of the park were protection of water (28%, n=14), protection of the forest or environment (24%, n=12) and a place for tourism (24%, n=12). Other reasons given were:

protection of air, beauty, wildlife, education, benefits for the rich, the communities or humanity in general, as a source of income to AMITIGRA and to annoy the communities.

Table 5-6 Reasons for the Existence of the LTNP

Reasons for Existence of the Park	Included in LTNP Objectives	Number of Respondents ¹	Percent of Respondents
Protection or conservation of water	Yes	14	28%
Protection of the forest or environment	Yes	12	24%
Tourism	Yes	12	24%
Production of air	No	9	18%
Beauty	Yes	6	12%
Protection of wildlife	Yes	3	6%
Source of income for AMITIGRA	No	3	6%
To provide benefits to the rich	No	2	4%
Environmental education	Yes	2	4%
To provide benefits to the communities	Yes	1	2%
Protection of humanity	No	1	2%
To annoy the communities	No	1	2%
Don't know	N/A	11	22%
¹ n=50. Response missing in five interviews			

These results are similar to those found by Barton (2001) and Schelhas and Pfeffer (2008) in Cerro Azul Meambar National Park where water and its link to forests was widely seen as important reasons for the existence of the park. In LTNP, a few people mentioned the protection of the forest and its water resources as a supply for the communities.

From what I understand it is an area rich in water. It is an area that nourishes many of us that live around La Tigra. I believe that many people that live around La Tigra understand that without this forest, without this Tigra, without this mountain, I always say, that we would be living a desert. Because it is where we get water and you know that water for everyone is life. (#107)

Although communities were sometimes mentioned, more often the park was seen as being protected as a source of water and other ecological services for the capital city, Tegucigalpa.

The little that I know is that the park is a protected area. Where, we say, that maybe it is the main lung of the Tegucigalpa. From this area is where Tegucigalpa, well, we say that from this area, from here, almost 60 or 70 percent of the water is from Picacho, that is, from this area. So it is benefitting Tegucigalpa. In this aspect, the oxygen, other things that one obtains from the forest, they are receiving. It is an area that should be protected and improved even. (#410)

As in the quote above protection for production of water was often expressed by residents as a positive thing or a source of pride for the community member. However, protection for water supply was also sometimes expressed as something that was being taken from the community without permission or compensation for the benefit of others, as described by two respondents below.

When AMITIGRA arose, it arose with this objective: to care for it for the rich. Because they have a community called El Hatillo, where the best houses in Honduras are, and the water that they have is from La Tigra National Park. That is the objective. So the objective wasn't to look after the mountain, the objective that they envisioned was to empower themselves from the mountain because it is going to provide us with oxygen and it is going to provide us with water. This was their objective when they started. (#201)

Well for example, it is, well, because of the water sources, because the waters originate there... It was for this, that there has always been water. All of life. And rather now the water has been reduced. Because in those times there was a lot of water but they did not take it for the Capital. All the water was used here. And there was more than was used. They used the water, not like now that SANAA takes it all. In those times the water didn't go to the Capital. All the water stayed here. (#504)

Creation of the park for the protection of the forest or environment was often more vague with simple reasons given such as “To protect the forest, above all else for this.” But some people mentioned also the need to protect it against deforestation:

They created it due to the fact that there was too much deforestation. That, at least here there was not much, but there was around Jutiapa, Montaña Grande, Valle de Ángeles, San Juancito, trucks just entered to cut wood. So because of that is why this is a protected area. (#309)

The other important reason that was mentioned for the creation of the park was tourism. This was often talked about as simply an area for people to go to enjoy themselves or experience a different atmosphere but was also associated with creation of income for AMITIGRA.

Well generally we say here in the community that they have it so that people come from other places and they go there to experience the mountains, it is for money, they say. (#103)

Of the 39 residents who provided a reason for the existence of the park, 56% of them (n=22) provided only one reason, 31% (n=12) provided two reasons, 8% (n=3) provided three reasons and only 3% (n=1) provided four or five reasons respectively. The majority of the reasons given are included in the objectives for the creation of LTNP, however it is evident by the number of reasons given by each respondent (less than five for all respondents) that people do not have a good understanding of all of the objectives. The predominance of the concepts of protection of water resources and protection of forest and environment are congruent with the principal priorities of the National System of Protected Areas of Honduras (SINAPH) and AMITIGRA and it is therefore understandable that this is the message most often passed to residents. The idea that tourism exists for creation of income for AMITIGRA reflects the view of residents who see tourists entering the park but do not feel they receive any benefit from this activity (see section 7.3.4).

5.3.5 Responsibility of Protection

Peoples' sense of the need for formal protection of the forest gives insight into their views on the effectiveness of conservation (Schelhas and Pfeffer 2008). To gain an understanding of these views I asked residents what would happen to the forest and trees if it was no longer a protected area. The majority of residents interviewed (91%, n=50) believe that if the

area was not protected the forest would be lost. This was usually expressed as a negative outcome or a “disaster”.

I think that it would be a disaster because if there wasn't anyone to see to this protection, in this world there are all types. You know that there are people that what they like to do is destroy. They take joy in these things. There would not be, well even birds, you wouldn't see them anymore; the wild animals would not be alive. (#102)

Well, if it stopped being a protected area, what could happen? Well everyone would enter it to cut the trees. They would cut them. There wouldn't be any order; there wouldn't be any limits, so maybe all the trees would die. (#402)

This potential loss of forest was usually attributed to cutting for firewood, burning or agricultural expansion.

Well I would say that if the forests were no longer protected everyone would cut it for firewood or something. But here they care for it. Because even when there are fires, they are looking after the trees, they are making things so that the fire doesn't pass into the trees. (#108)

Oy, everyone would set fires there. Everyone can destroy the mountain. And there wouldn't be any trees and the sources of water would dry up and we would die. (#506)

This would be a problem. The hand of man would arrive only to destroy. Because, so much beauty that we see in this Tigra, only imagine that when we are with people that unfortunately, have understanding of agriculture, they say the earth is for working, for planting a plot of land. You can imagine that if there was no longer order in this Tigra, everyone would go there because in the times we live in, in times of drought, in low time, many times, the crops don't produce. And so people would look, in certain moments, in protection. (#107)

Similar to results in Cerro Azul Meambar National Park found by Schelas and Pfeffer (2008), people often spoke of the water drying up, that the area would become a desert or the heat would be unbearable.

Well if we think about it, if everything was left free, to free will, I believe that there it would not be forest but a desert. There would be no water, there wouldn't be anything. (#505)

Well we know in advance that the climate, all of the way of life would change. Because we are talking that in reality there would not be forest, we are convinced that there would not be water, the climate would be different and there would be areas that would not be habitable. (#410)

It would be a very hot area. Because, like I said, without forest, imagine if the whole forest was lost, we would be left with sun until we were burnt. (#101)

The idea that the forest would be destroyed reflects an understanding of the need for a protection of the park. Despite some problems with administration of the park (see Chapter 7) it was understood that the area needs to be protected by someone, either the community or an external institution, or else it would be destroyed.

There would be destruction if there was no control or if there wasn't anyone interested in looking after it. Because the awareness comes from there, that there are laws and capacitation of the people that live on the edge of the park. There is a lot of education that we must care for it, care for the animals, care for the water sources, that there is no deforestation of the forest. (#501)

The potential destruction of the area was often attributed to outsiders, not people from the community, and in one case even by the state forestry corporation COHDEFOR (now ICF).

Well, then what it would create is almost a desert. Because if there wasn't protection and someone to care for it, people, maybe not people from here but people from other areas could enter. Maybe go into the mountain and destroy what is there. And so we would be left with a desert. (#307)

There would be destruction; I believe there would be destruction. Because, like I said, although here we are aware of what it is, but from here on if it stopped being cared for, if the institution that is in front right now wasn't here, this would go to destruction. There are people that don't think of tomorrow but in destroying. This would be the logical thing. (#410)

It would be destroyed. Yes, they would destroy it because you know well that now COHDEFOR, all they look for is money. And they would come into this mountain to destroy it. (#209)

The idea that COHDEFOR would destroy the forest is consistent with the lack of knowledge of residents of the role of COHDEFOR (now ICF) in park management and protection (see section 5.3.7).

Almost all of those who thought that nothing would happen to the forest if it was no longer a protected area attributed this to the fact that the communities would continue to look after the forest.

Well I believe that if those in charge of these matters of preventing access to damaging the protected area left, I say that the communities, I believe that they have the capacity and the knowledge to continue with that work of protection of the area. (#412)

Nothing would happen because the communities have always been willing to take part in the mountain. The communities, all of their life. AMITIGRA only recently. It hasn't been long. The mountain existed and before AMITIGRA arrived the mountain was beautiful. When AMITIGRA arrived it stopped being beautiful. (#201)

Only one person thought it would be better if the area was not protected as people would not be restricted in their activities.

It would affect us because, like I said, if someone wants something they have to fight a lot to get it. And so this affects us because if it wasn't protected we would simply go and use what we needed and that's it. (#203)

Literature on local peoples' views on who is responsible for conservation of forests indicates that local people often believe they are responsible for conservation but also many times delegate the responsibility to others such as government (de Albuquerque and de Albuquerque 2005, Baral and Heinen 2007, Durand and Lazos 2008). To get a better understanding of the perceptions of responsibility of protection I asked residents who they felt was responsible for caring for the forest in their community (Table 5-7).

Table 5-7 Responsibility for Caring for the Forests

Who is Responsible	Number of Respondents¹	Percent of Respondents
The community	41	77%
AMITIGRA	18	34%
Everyone	9	17%
ICF or Government	6	11%
SANAA	1	2%
Don't know	1	2%
¹ n=54. Response missing in one interview		

The majority of residents (77%, n=41) believe that the community is responsible for caring for or protecting the forests in the area. Durand and Lazos (2008) call this “shared responsibility” where people see themselves in a group with a collective responsibility. This community responsibility was often expressed as necessary since they are the ones who are most connected to the forests in the area and who know most about what the issues are.

Well in this area here well it would be us who are responsible. Or I should say we who live here because we are living from this forest. And so it is up to us to care for the area of the mountain, or the forest, the area here. (#202)

Ourselves, we could say, because you cannot put it on one person. For example, you are not going to care for the forest, you cannot care for all of the forest. We are responsible, those that live in the community, or whatever, we should care for the forest. (#303)

The idea that AMITIGRA was responsible for caring for the forests was less dominant, only 34% (n=18) of respondents identified AMITIGRA as being responsible. Although some people identified AMITIGRA as being the sole or main entity responsible for caring for forests, a “delegated” responsibility (Durand and Lazos 2008), other people incorporated the idea that although AMITIGRA was partly responsible, the responsibility was shared with or primarily the responsibility of the communities.

Well, everyone. The forest is everyone's. The air doesn't have an owner. The oxygen doesn't have an owner. And so clearly the responsibility is everyone's. There are some

more than others because, look, we have AMITIGRA. They pay them specifically for this, to look after the forest, promote caring for the forest, and strengthen the forest. But that they look for a way that in the buffer zone that one can live in the area but at the same time the area is cared for. But unfortunately they don't do this work. They lack much to do. They have dedicated themselves more to tourism, more to tourism than the sustainability of the mountain. (#201)

At least I consider that it is those here, we belong to this community, we as inhabitants are in charge of caring for it, of protecting it, and well, to do everything necessary so that the forest persists and is not destroyed, to have the benefits that I was telling you about earlier. But like I said, sometimes, unfortunately there has to be other types of institutions that are here to be able to achieve this because, for example, here we have the institution AMITIGRA that is in charge of watching over it. But I think that in spite of this, the community already has this care to protect the forest because we know that it is ours. It is not AMITIGRA's or the governments.' It is ours. (#410)

People also talked about the idea that it should be the responsibility of the community but they were no longer allowed to hold this responsibility since AMITIGRA took management of the park.

The responsibility is here but now they don't let us. Before it was us, the owners of the land, but now, like I said, it is another, now it is AMITIGRA, COHDEFOR and SANAA and everything, that is who is here. (#208)

Only 11% of respondents (n=6) identified ICF or the government as being responsible. Given the relatively hands-off role of the government in day to day management of the area, this result is not surprising. These relatively lower responses of AMITIGRA and ICF as responsible conserving for the forest, however, is interesting given that people identified caring for the park or the forest as one of the main responsibilities of AMITIGRA and ICF (see section 5.3.7). It is possible that residents were identifying forests in their community as outside the park (not in the core zone) and therefore not the responsibility of AMITIGRA or ICF.

Other groups identified as being responsible for care and protection of the forests in the area were the more general “everyone,” which sometimes included the whole world, and SANAA. One person said that they did not know who was responsible.

To understand how the responsibility to care for the forest translated into conservation actions and what actions they viewed as conservation actions, I asked people what they did or have done to conserve the forest and the resources that they use from the area. Residents listed a total of 11 conservation actions in both answer to the direct question and other areas of the interview where a respondent’s behaviour was specifically mentioned as being conservation oriented (Table 5-8).

Table 5-8 Conservation Actions of Respondents

Conservation Actions	Number of Respondents ¹	Percent of Respondents
Plant trees	11	23%
Reduce firewood consumption	10	21%
Participation in community organisations and training	8	17%
Care for the forest or trees	6	13%
Change where or how they get firewood	5	11%
Cleaning up garbage	5	11%
Sustainable agricultural practices	5	11%
Fire fighting	2	4%
Maintain water tubes	1	2%
Teach the children	1	2%
Work for AMITIGRA	1	2%
None	12	26%

¹n=47. Response missing in eight interviews.

The most often listed conservation actions were planting trees (23%) and reducing firewood consumption (21%). Planting trees was usually cited as planting trees on one’s own property or reforestation as part of an AMITIGRA initiative with the community or the school and often took place years previously.

One here always tries to plant avocados, mango trees, like you see for shade. They serve you for consumption too. (#101)

Except, rather we here in the community have reforested. Even with AMITIGRA we have reforested. (#308)

Well we always go out to plant trees with the children. Every year we go out to plant trees, to reforest would be the word. (#104)

Reduction of firewood consumption by using an eco-stove, a propane stove, less wood or only using wood for subsistence needs was also mentioned as way to conserve resources.

Of course one cares because primarily it is far to go looking for a bit of firewood and so one cares for it so that it lasts. (#210)

Participation in a community organisation or community meetings was mentioned by 17% of respondents as a conservation action. This included participation in meetings with AMITIGRA as well educating other community members as part of the community water committee or town council.

Yes because when there are participations like meetings, we participate. When they get us together, they invite us to know how to care for the forest. (#411)

Well we here, as the water committee, we look for a way to protect the area where the water comes from. We try to orient the people when we have a general assembly we always mentions "Gentlemen we have to protect the forest because it is what gives us life" - in one form or another. And so we, like I said as the water committee, always go around attentive to these aspects. We say to the people what is not appropriate to do and what is appropriate to do. Even, as the water committee we have a project that when [Hurricane] Mitch came there was a project to reforest there, between the community and AMITIGRA. (#410)

In Juncales the water committee and town council are actively involved in forest protection within the community and have informal penalties against tree felling and other resource extraction deemed harmful.

We here actually have a penalty of 1,000 lempiras to a person that we find cutting mosses, grasses, ferns, palms, because in general here people look for ways to work by destroying nature but we don't let them. Here we are some 80 families that benefit from the water committee and so through the water committee if someone doesn't want to collaborate with us we give them a penalty 1,000 lempiras. And if they persist, we cut off the water to their house. The funds go to the water committee. (#309)

No well, here we are integrating ourselves. We, ourselves, all the beneficiaries of the water committee are caring. Because including a little while ago we sent a note to AMITIGRA so that they would put guards here. Because there are times when they don't come, only in the dry season to look at the forest. And so we, from the real mountain, have to look after the watersheds because people take things like pacaya, green things that contain the water. And so we will be harmed by this in time. Including here people have sent a note to make them see that we ourselves are not doing anything wrong. Because with time we will not have any water. And we have applied a fine, and rather, I don't know if it has been sent because I am not part of the water committee but they said they were going to send a note to AMITIGRA so that they, as an authority, would also try to see to this. And so we applied a fine of 1,000 lempiras to those that we see deforesting the forest or taking things from the mountain, pacayas or things from where the water comes from. But these things have to be all the water committees from this area because what does it serve that we put a fine of 1,000 lempiras on the beneficiaries from here and other committees are doing the harm in other areas. And so with all of this we agreed to send a note to them and at the next meeting we will have to see what they say. (#306)

The initiative of self-enforcement within the community indicates a high level of awareness related to forest degradation and conservation. Although this mechanism circumvents the formal regulation of reporting to ICF and the federal attorney general, it may be better accepted locally as revenue from enforcement goes back to the community water committee.

Like planting trees, caring for the forest or the trees was often associated with retaining trees on private property.

Well to protect it, for example if I am in my farm plot and I see a tree that will serve me tomorrow, I let it grow. Because I cannot- Assuming that it doesn't serve as firewood, I cannot pull it up or leave it so that it dries out because this bothers me because I am not going to use it and so better that it lives. (#110)

Ideas related to changing where one gets firewood as a conservation action include: not cutting standing trees for firewood, not getting firewood from the mountain or forest but from private property and only using dead wood.

I do this by regulating the shade, the firewood that I use for the fire is waste that I find. I try not to damage the forest. We can manage all of this. We can have our properties, care for the forest on them so that we don't damage the mountain. (#507)

Twenty-six percent (n=11) of respondents said they did not do any conservation actions. Most respondents said simply that they did not do anything but two respondents also stated that the forest does not require someone to take care of it, that it takes care of itself.

Now I am going to say something, the forest rises no matter what. You don't have to give anything to forest because the forest maintains itself. You know well that where there are trees there are seeds, they multiply themselves, don't they. You don't need to go caring for them. The forest, to the contrary, gives. (#504)

Another respondent said that there was no incentive to take conservation actions as this was done by AMITIGRA as in the quote below talking about putting out forest fires.

Well the only thing is be careful to not destroy it because like I said the problem is that since there is someone that cares for it, one can only subdue because there is someone that looks after it. Now if there wasn't someone to care for it well one would have to make some decisions. And so what they do is subdue. Well it is, look, the problem is you well know that there is always someone to care and so the people say "Well they are gaining" and since they are gaining they watch them put out the fires. And this is a reality. (#409)

Despite the focus of many AMITIGRA management activities and programs on water conservation, no one mentioned any specific conservation activities related to water conservation, other than one resident who described his activities of maintaining the water pipes and members of the water committee in Juncales who were protecting the forest for the water resources.

Similar results were found when I asked people what they would like to do to be able to conserve the forest or natural resources. Residents mentioned 17 actions that they would like to be able to do to conserve the forest and resources (Table 5-9). When asked, 23% of people (n=12) said that they did not know or that they would like to “care for the forest” without specifying any specific actions.

Table 5-9 Desired Conservation Actions of Residents

Conservation Actions	Number of Respondents¹	Percent of Respondents
Plant trees	19	37%
Education	14	27%
Organic agriculture	6	12%
Waste disposal	5	10%
Community tree nursery	4	8%
Non-agricultural employment	4	8%
Fire control	4	8%
Energy forest	3	6%
Stop people from cutting trees	3	6%
Modern agriculture	2	4%
Distribution of dead wood	2	4%
Use a gas stove	2	4%
Use an ecostove	1	2%
Production of non-timber forest products	1	2%
Sewage control	1	2%
Water conservation	1	2%
Wind energy turbines	1	2%
Don't know/Care for the forest	12	23%

¹n=52. Response missing in three interviews

The most mentioned desired conservation action was to plant trees (37%, n=19). This was mentioned as the desire to replant deforested areas but also the idea that people could replant trees for every tree used or plant trees that could later be cut and used for personal uses to reduce cutting in the forest. Three additional people specifically mentioned a bio-energetic forest that could be planted and controlled specifically for community uses. Four people also mentioned

community tree nurseries. Although AMITIGRA runs tree nurseries in some communities they are used for AMITIGRA initiatives and not open to public use.

This is what we were looking at when we realised that there are 25 town councils within the park. First we want to reforest the watersheds, because [Hurricane] Mitch destroyed almost all the watersheds. They, the trees, have been coming back bit by bit and in some parts it is still denuded, there are no trees. And we were thinking of making tree nurseries, to reforest these areas with our own communities. (#505)

Well in the first place it would be to reforest the areas that are empty of trees, reforest them. But here what happens is that this land was donated with the purpose of making more houses for families. Because here there are 28 families that are living in the previous design of houses. But these families have multiplied and up to three families live in one house and to do that we need more area to expand. (#304)

I believe that it would be to plant trees for one's own use and to keep planting. And with that we would be sustainable so that we would not need to cut down the forest. (#307)

I have always said that we should make an energy forest. Wood that grows quickly, trees brought from other countries. We also have eucalyptus that is a species that is brought here but no, it has not been put to that purpose. Because there should be an energy forest to take firewood from. Or fenced in on private properties, it could be close to the mountain that they plant them with this purpose. (#412)

Fourteen people (27%) mentioned that they would like more education about conserving the forest or they would like to be involved in teaching people more about the importance of the forest.

We lack a lot, a lot of education. And actually people from other places could come, or the organisations, and actually tell us what benefits we obtain from the forest so that we can use them without necessarily damaging it rather than we use it rationally. (#510)

What happens is that we don't use them correctly but rather incorrectly. And so, unfortunately, we want education in this area. That would correspond to AMITIGRA to do this, so that the people understand what they have to do to use, not trees, but what is in the forest that one can use. (#401)

Well personally I say that I would like to educate people. There are people that act like the forest is ours and everything but I think that I would start by educating them to understand the benefits the trees bring us and if we cut down lots of trees the watersheds

will dry up. Teach people, make them understand that they can be conscientious of the richness that we have in our community, in this case, and that we have to care for what is ours because it is ours. (#207)

Organic agriculture was also mentioned as something people would like to be able to do to conserve resources in the area.

Work with other mechanisms that are not...that don't harm the environment. Not using chemicals, that we could produce without chemicals. (#308)

Well I think that it would be interesting if there wasn't any type of contamination in the area. That everything was free of chemicals and that also we learned to do some practices so that there is no soil erosion. And that the resources that there are last much longer for us and every day, well, instead of degrading, well, we would be strengthening. (#401)

Well for natural resources, what would I do, or what could I do? In the first place for the products that we harvest, we could use fertilizer that is natural. That there would be no more chemicals. For example, up until now, I am not going to say that we don't use chemicals but we use less chemicals, much less. Not like before we used all types of chemicals, I'm talking about chemical fertilizers, chemical fungicides, or only thing that were highly toxic. Now, thank God, not anymore. Because now we have more or less learned about compost, that is a fertilizer that is very good and gives a lot of energy to the plants. And in this part, well if we had sufficient knowledge, everything would be much better, to work with natural things. That would be a good benefit, including even in the market (#402).

Based on these results of conservation actions and desired conservation actions there is good understanding by the residents of LTNP of the need for protection of the forest in the area and the role of the community as responsible for this protection. There is also some, although weaker, connection of this responsibility to actually doing conservation actions. These associations and local ideas for resource conservation can be built on to improve conservation dialogue, two-way education and action within the communities.

5.3.6 Tree Cutting Norms

Residents value the conservation of the forest but have other values which appear to conflict with conservation. To understand other values which may compete with forest conservation values, I asked residents if it was ever okay to cut trees and if so under what circumstances. Twenty percent of people said that it was not okay to cut trees mainly stating the benefits of the forest as reasons (see section 6.3.2), although one person said that it was not okay because it is illegal. These answers may have been what people thought they were expected to say or felt they should say after outlining the benefits of the forest. The other 80% of residents expressed that it was okay or necessary to cut trees in certain circumstances. Most of these people noted that it was not good to cut trees but it was sometimes necessary if you were going to use it or needed wood for construction, firewood, or fences, often justifying this use with statements that people had no other choice.

It is that the necessity always exists. Because, I am going to give you an example of my boss, where I work there is the necessity to fence the property. I imagine that he has to use let's say one or two trees to make posts and with live fences you cannot put up wire because that in itself is killing the plant and so in that case it is necessary. Yes it is necessary. (#107)

I know it isn't good but one's situation, campesino, that doesn't have means for electricity has to do it, right, use wood. (#304)

It depends right? Because look I will give you an example, trees, well I believe that they should also be of service. Let's say a person wants to build a house I believe that you can't prevent this tree from being used because you already know it is for a house, or to make a fence or something useful. But here what has happened is that when there are people that want a tree they have to go ask permission, of course. It is an order of the law. And also to cut firewood it has to be trees that are fallen, not trees that are green. (#409)

Many people also stipulated that cutting trees in excess, just for the sake of cutting or cutting without proper management was damaging but it was okay to cut trees for personal use if you needed to use it.

I say to cut one just to cut it isn't good. But if you have something that you have to do, an idea we could say for constructing a house then it is okay to cut. Or for firewood. Well although nowadays one gets firewood that is on the ground because that is what we do, we use firewood from the bushes and all that. Just cutting a tree to cut it, no I don't believe that is good. (#303)

I think that in a, how do you say, controlled way, the use of firewood for family consumption doesn't affect the forest, in a controlled way. And what one uses for housing, I think that the forest itself gives us this wood. (#501)

You have to use it. I am going to give you my criteria, my knowledge. I studied, not much what I got was high school, but as I understand that when a person is studied here in school or in university it is to go forward, not to stay back. The forest when it is not clear or you don't take wood, the plants stop developing. In all the countries in the world they use wood, one just has to know how to use it and protect it at the same time. Plant more trees. Cut one, plant 10 or 50. That is what they don't do here. It is knowing how to use it is what one wants. And they have not done this here. I know the most developed countries in the world use wood but with good purpose. And so for me they are resources. (#212)

It was also common for people to mention that it was okay to cut trees for personal use but that you also must replant more than you take in order to maintain the forest. This sentiment was repeated throughout the interviews whenever the topic of tree cutting was raised. Tree nurseries were often mentioned as a solution to this problem. Although AMITIGRA runs tree nurseries in several communities they are used in AMITIGRA run planting programs but not open for individual community members.

In reality we have to manage trees. First we have to see if the tree is about to damage something. And so what do we have to do? Get rid of this tree and plant another. For example we, with my boss, what we do is that if we see a tree that is going to damage a power line or a house, that is about fall, what we do is try to plant a tree on the other side. And not just plant one because if we cut one we plant three, four. We plant them in front of the other. But we are conscious of this. I always manage the tree nurseries but

when we say “Ah this tree here is going to damage, it is bothering or it is shading the garden, oh how beautiful that tree but we have others.” We plant others closer where they will extend. We have some rules to maintain the trees. Yes we are going to cut but it is not necessary to totally cut it so we are going to regulate the shade, regulate it with techniques, we can’t cut them completely. Unfortunately occasions present themselves that we have to get rid of one. Well if we take some we plant double. Well we have learned this and it is what we are doing. I am applying what I have learned. (#507)

Look I think that that is what tree nurseries are for. I say that if you come and need a tree, because in actuality here where we live we need wood for the roofs of our houses, but I say that in cases where there is necessity, this is what tree nurseries are for, trees that are not fruit tree but for wood. This is what nurseries are for. And so tree nurseries are what people around here want. Awareness. Awareness and to make nurseries so that a long time from now they can cut these trees, or for reforestation. If you cut at tree, we say that you cut 10 trees, plant 50. (#505)

It is good and necessary, clearly it is good too to take into account that it is good to reforest or you could say cut one and plant five or ten more trees. (#207)

A couple of people also noted that it was okay to cut trees to plant coffee because you planted shade trees afterwards which reforested the area.

Here it is a coffee zone. The majority here don’t grow corn; it almost doesn’t produce because it is very cold. Here what produces most is coffee. And coffee needs shade. Look you can see those big trees that are there? If coffee didn’t need shade we would have cut them. But rather we need to plant shade because if the sun hits where the coffee is it burns and dries out. And so it is better to plant trees. We here, the trees, here we go about hauling trees, planting the seeds, nurseries to plant them as well. Here on the properties, here we have few trees because, look the beetles have dried them out. Right now there is a plague of animals that is confronting the trees, the trees dry out and they fall. They are going in circles because there are beetles here. This is a plague. And so rather one must be planting trees. Here rather one has to plant trees and not just because sometimes they dry out because of the beetles, but the coffee is what we most need the shade for. (#504)

Well here, here they plant coffee and so they cut the trees but since it is coffee you must plant other trees and so it is reforested again. (#309)

People also mentioned that it was okay to cut trees if they were dead, diseased or were too old to be seen as ecologically useful.

Well there is a period that it is necessary because if you don't cut the tree you lose it and trees are for that, for giving utility. At the same time if we cut one tree we must plant some 10, 20, 30, 40 and maintain them. But here they cut trees also that something has happened to, since there are huge trees. The community suffers from a disease, here there are woodworms and termites. These two things have arrived in the forest now and there are many plants that they have cut because they have woodworms and termites. (#201)

No, in my way of thinking, I agree that if a tree is dead and isn't feeding any [water] source. But it is necessary to be careful because in reality I am one of those that doesn't think you should go and take the life of a tree because it is a sapling more than anything. In my way of understanding. (#110)

It depends. In moderation. For example there are trees that have already completed their cycle. They can be used. But that is where the awareness of the person comes in because there are people that do not have conscience and they go and down new trees. There are trees that have already completed and well, yes they can be used. (#302)

A tree that was harming something or could potentially damage something such as a power line or a house was considered okay to be removed, often without permission or a permit.

Yes for example, here if we need something for construction well we go to AMITIGRA and COHDEFOR and they give us permission to go cut a tree. Like I said before if a tree is going to damage the house or in other aspects like our crops then we simply cut it. (#309)

Sometimes no. Sometimes for me it is necessary to cut a tree but in a part where maybe it is damaging. Like if I am going to set up my house and there is a tree there in a part where it is damaging. But for me, no. (#202)

Only two people mentioned that it was necessary to cut trees to cultivate the land. This may be because other than the common lands or cooperatively held lands most people had all their lands under cultivation and therefore it was no longer necessary to cut trees to cultivate. The low number of people who mentioned cutting trees for cultivation may also reflect the ambiguity around when second growth brush on fallow land become forest (see section 7.3.3).

Of course it is. I repeat, of course it is necessary. To be able to plant because this is how we live. How is it not necessary? But they don't let us, we would go to jail. For example

if there was a sapling of however many inches then people would even- I have a little garden there that I don't even leave shrubs on because although I have ownership papers I don't have anything. When I came, from this plot above, when I came from these woods up [the mountain] they didn't work but from those woods down they did work. Now they don't work there. And for us this is a problem because we don't have work. And how are we going to live if we go somewhere else, well we would have to know how we would live. (#503)

People integrated conservation values related to the forest and forest benefits with qualifying statements of specific circumstances when it was okay to cut trees. These statements modify conservation values by emphasising the importance of livelihood values but also how they fit into conservation such as only cutting trees for necessity or the need to replant many trees when one is cut. In this way residents did not see their personal use of trees as harming the forest and contrasting with other forest values.

To understand if local values of tree cutting were enforced and how this was perceived within formal cutting regulations I asked residents what happens if someone is seen cutting a tree. The majority of people (69%, n=38) indicated that if you were seen by AMITIGRA or ICF you received a fine or went to jail and 9% (n=5) mentioned that you would receive a reprimand from the authorities. An additional 9% (n=5) said that it was illegal but did not specify any consequences to being observed cutting a tree.

If those from AMITIGRA or COHDEFOR or SANAA see someone they put them in jail. (#208)

Well if here someone is seen cutting a tree, well people from here don't say anything. But if those who, well others come here, but like I said here it is necessary to cut a tree and if you are going to cut a tree you have to get permission to cut it, and if not you cannot cut it. That is the reality. And so if they see someone cutting without permission then they take them to jail. That is the situation. (#508)

Well they call it to their attentions so that they do not do it again, the first time. Then after that it is possible that they could even denounce them to the authorities so that they don't continue doing it. But the first time they call their attention to it. (#504)

Well it is prohibited by AMITIGRA and you have to submit to the laws. But AMITIGRA is in charge of that, making sure the laws are obeyed. (#308)

Although the majority of residents felt that the community was responsible for caring for the forest only 15% (n=8) responded that if they saw someone cutting a tree they would intervene or talk to the person themselves. These responses were most prevalent in El Carbón but also expressed in Juncales where the Water Committee is organizing to enforce regulations themselves.

Well I personally would call attention to it. I would call attention that instead of destroying a tree it is better to protect. One must care. Well in the community our obligation is to care. (#101)

Right now, incidentally the Water Committee is charging a fine of 1,000 lempiras per person who cuts a tree. (#302)

I believe that if the community found out they would chastise the person. (#105)

Four people (7%) said that when someone is seen cutting a tree that nothing happens. These comments both expressed as concern or frustration that the authorities were not doing their jobs and that threats of fines or jail were empty and park guards turned a blind eye to small scale cutting.

Normally if someone is seen cutting a tree nothing happens. Now if those from AMITIGRA come, the bosses there, you go to jail. They take you to jail. But normally there are plenty of people here that cut trees secretly and AMITIGRA doesn't have the capacity to send people to watch the situation and tell people. Besides people go to cut firewood in the forest. They cut firewood and pass right in front of the authorities and nothing happens. (#201)

They say that you go to jail but it is a lie. They don't do anything. People cut trees and they turn a blind eye. (#506)

I don't think that anything happens. Well, at a small scale, I don't know what would happen is someone cut a hectare of trees. But if here someone cuts a tree close to their house, nothing happens. (#509)

Only one person said that they did not know what happened if someone was seen cutting a tree.

Overall the illegality of cutting trees without permission was well known indicating a high level of knowledge of these regulations. However, enforcement of these regulations was largely seen as the responsibility of AMITIGRA or ICF rather than the community or individuals. This may be a result of the formal regulations being incompatible with the local values of the necessity of cutting trees for personal uses and the frustration over the time and cost associated with the formal permitting process (see section 7.3.1) or potential social norms of not interfering in their neighbour’s actions.

5.3.7 Responsibilities of AMITIGRA and ICF

Communicating the roles and responsibilities of AMITIGRA and ICF so that residents understand management activities is important in creating a working relationship with residents. Objectives and responsibilities of AMITIGRA are outlined in section 4.4. To gain an understanding of residents’ knowledge of management I asked what responsibilities of AMITIGRA and ICF were (Table 5-10 and Table 5-11).

Table 5-10 Responsibilities of AMITIGRA

Responsibilities of AMITIGRA	Number of Respondents¹	Percent of Respondents
To care for and protect the park and resources	37	69%
Law enforcement	12	22%
Work with or provide benefits to the communities	11	20%
Attend tourists	6	11%
Education	2	4%
Act as authority in the community	1	2%
They don't do anything	1	2%
Don't know	12	22%
¹ n=54. Response missing in one interview		

Seventy-seven percent (n=42) of respondents gave at least one responsibility of AMITIGRA and 22% (n=12) said they did not know their responsibilities (Table 5-10). The most common responses were: to care for and protect the park and park resources (including general protection and firefighting; 69%, n=37), enforce regulations and laws (22%, n=12) and work with or provide benefits to the communities in the park (20%, n=11). Protecting park resources was seen as the primary responsibility of AMITIGRA: “Protection. Above all else protect the forest. Protect La Tigra (#402).” One person even said that the communities often expect things of AMITIGRA that are not their responsibility.

Sometimes the communities want more, but their duty is the environment and one has to understand that and so that is what they must dedicate themselves to, but there are times that the communities are always expecting more. Like more, like settling other things that are not the purpose of AMITIGRA. The purpose of AMITIGRA is to look after La Tigra National Park. (#501)

When talking about the responsibility of AMITIGRA to enforce the laws, park guards were often mentioned as the ones responsible for this activity. This direct connection of the park guards are part of AMITIGRA, not just employees of AMITIGRA, was largely distinct to this response. In most other parts of the interview AMITIGRA as an institution was viewed as the managers and technical staff.

They are the resource guards, they are like foresters. They walk to all areas where there is deforestation. And so they walk around prohibiting that trees are cut, because it is prohibited. (#506)

I believe that now that is what the forest guards are for. Including, there is a forest guard that is from the community, I don't know the others, but yes their obligation is to watch that there are no fires, that the people are not cutting the trees. (#102)

The response related to working with the communities or providing benefits to the communities differs from the responses related to reasons for the existence of the park, where

only one person mentioned benefits to the communities as a reason for the existence of the park (see section 5.3.4). The responsibility of AMITIGRA towards the communities was expressed as both the responsibility to communicate with people in the communities as well as the responsibility to develop projects to benefit the communities.

For me the responsibility of the Amigos de La Tigra is to have good communication with the communities. Not be, how should I say it, brisk in dealing with people in the communities because they are working within a protected area. But give them a way out of their problems. Because for me that is the maximum authority in all this area around here, La Tigra. So for me the responsibility is to have good communication. And to bring projects, plan projects with the communities. This would be the help that the communities would receive and they would see that it is also worth it to support La Tigra. (#107)

Other responses related to responsibilities of AMITIGRA were: to attend tourists, provide environmental education, act as an authority in the community and that they don't do anything.

These responses are congruent with responses from key informant interviews with managers who stressed that the primary responsibility of AMITIGRA is to protect the forest and forest resources as well as to work with the communities. One manager expressed:

Like I said, one of the objectives was to conserve the features of the forest. But the community uses the forest. And so as part of our strategy, the Foundation created what is the first program of natural resources protection where we attack the most direct problems, forest fires, hunting and the advance of agriculture. On the other side we also create the program of community participation. With the objective, also, we are controlling the farmer and he doesn't like that, and so we are creating community participation that educates and generates other types of beneficial projects for them. (KI-C)

Similar to responses of the reasons for existence of the park, of those residents who provided an answer 47% (n=20) named only one responsibility of AMITIGRA, 38% (n=16) named two responsibilities and only 14% (n=6) named three responsibilities and, as stated above,

22% (n=12) people could not provide any responsibilities of AMITIGRA. The lack of in depth knowledge of what the management objectives of the foundation are, related to resource conservation objectives and to working with local communities may be a factor in issues related to conservation and livelihoods and create negative attitudes towards park management (see Chapter 7).

Even fewer people were able to define the responsibilities of ICF. Only 47% (n=26) gave at least one responsibility of ICF in the area and 53% of respondents said they did not know the responsibilities of ICF (Table 5-11).

Table 5-11 Responsibilities of ICF

Responsibilities of ICF	Number of Respondents¹	Percent of Respondents
Look after the forest	16	29%
Give resource extraction permits	15	27%
Law enforcement	7	13%
Don't know	29	53%
n=55		

The responsibilities provided included: caring for or protecting the forest (29%, n=16), giving resource extraction permits (such as a permit to cut a tree; 27%, n=15), and enforcement of regulations (13%, n=7).

It was also very common for people to have only heard of COHDEFOR, which was restructured and renamed ICF in 2008, and to be unfamiliar with ICF. When people referred to ICF's role in caring for the forest, it was often associated with doing the same thing as AMITIGRA or sometimes that ICF used to have the responsibility for looking after the forest but now it was the responsibility of AMITIGRA.

Look principally, well, there is no worker from COHDEFOR, which now has another name. But they have almost the same role as AMITIGRA. Look after the park and that was what the duty of COHDEFOR was; the same as AMITIGRA. (#505)

Only a few people recognised the role of ICF in forest management in both protected and not protected areas.

Well in the first place their policy is, like I was saying, protection, above all else of the resources that are within the protected areas and not protected areas. (#401)

More often people associated ICF with the permission to cut wood as their primary responsibility and did not understand their role in the park itself.

Because it seems like they are in charge of pines. They are hardly interested in the broadleaved forest, rather in pine. I don't know why. Because they give the permissions to cut wood, they give permissions for these things. Meanwhile here in what is the actual core, the forest, COHDEFOR doesn't have almost anything to do with it. (#507)

Related to the role of giving permissions to extract resources, the responsibility of ICF to enforce laws was also recognised.

ICF above all is when there is a denouncement and legal cutting of trees, that is where I have seen them a lot. I don't know if, unfortunately some things one doesn't realise, if they have more of a presence here. It is rare now. This was at the beginning, some 10 or 12 years ago you saw a lot of tree cutting. Now there is more awareness. But yes, ICF, in this aspect is where I have seen them. They have presence here in the area when they have to make a report, an inquiry or there is deforestation without permission. (#501)

When speaking of the responsibilities of ICF or their lack of knowledge of what those responsibilities were, many people (38%) commented that they have little or no contact with ICF and that they do not come into the communities.

It is almost the same situation that AMITIGRA has, the difference is that ICF really has not been close to the communities, like I said, so far we have had little relations or contact with that institution, but it has not been very close. (#410)

People also believed that AMITIGRA has all the responsibility and that ICF has little responsibility in the area beyond permissions or enforcement or they didn't know what the responsibility of ICF was as they thought that all responsibility was given to AMITIGRA. This idea was expressed as both AMITIGRA has been given all the responsibility when COHDEFOR

left (the few government guards were pulled out of the area when COHDEFOR converted into ICF) and that AMITIGRA has taken all the responsibility from ICF.

Well in this area the only thing that ICF does is leave things to La Tigra. They only sign permits and it is La Tigra is who does everything. Until now, because from ICF, I see that they don't even come close to here. And so what I see is that it is those from La Tigra who do everything and they only sign, those from La Tigra do everything. That's it. And so their responsibility is to look after the forest. In this area I see that they have left this responsibility, the duty to the Foundation. Because before they had a guard in this area but they removed him. I imagine that because of this those from La Tigra are here. (#107)

And so the people, what has been left to them, it what AMITIGRA does. Because it is not COHDEFOR anymore. Look, I am going to speak clearly in this, AMITIGRA rose up, they gave them the power of forest protection. But AMITIGRA is an NGO and I know what an NGO is, I don't know about everybody else, but it is a private entity. It is not the State. The State gave them the power and they shouldn't have done that. They have taken the power from COHDEFOR. AMITIGRA, if we speak plainly, has more power than COHDEFOR. COHDEFOR can't do anything without consulting AMITIGRA. And it is not right. (#212)

The perceptions that ICF has little responsibility in the area outside of permissions and law enforcement is not far off of the views expressed by managers of both AMITIGRA and ICF that ICF has little to do with daily management of the park (see Chapter 4). However, this perception creates a misunderstanding of what ICF's role as representative of the government in establishment and management of the park it and may delegitimise activities of AMITIGRA who is a third party largely responsible for environmental management and perceived to be not responsible for the communities or accountable to ICF.

5.3.8 Where Knowledge Was Gained

Where people gain their environmental knowledge provides an idea of how forest values are transferred within communities. Schelhas and Pfeffer (2009) found that global environmental values have considerable power in rural communities in Cerro Azul Meambar National Park and

that they found them to be widely incorporated into the ways people talk about the environment. This is similar in LTNP where people recognised environmental change in their community and expressed understanding of conservation objectives such as protection of forests for water and air (see section 5.3.1) as well as some of the issues dilemmas associated with living in a protected area (see Chapter 7). Information on where people gain knowledge can also be used to evaluate the reach and effectiveness of education and community involvement programs as well as identify where to focus future programs (Barton 2001).

Residents of LTNP identified ten sources of environmental knowledge (Table 5-12).

Table 5-12 Sources of Knowledge about Forests and Parks

Sources of Knowledge	Number of Respondents ¹	Percent of Respondents
Life experience	19	36%
Family	15	28%
School	15	28%
AMITIGRA	9	17%
Community organisations	8	15%
Workshops	8	15%
Church or bible	7	13%
Television or radio	7	13%
Talking to people	6	11%
Personal study	4	8%

¹n=53. Responses missing in two interviews.

The sources most frequently mentioned were life experience (36%), from a family member (parents, children, spouse; 28%) and school (28%). Learning from life experience was often expressed as having learned from living and working the land in the area, comparing their community to other communities or just inherently knowing.

I have walked and worked in this whole mountain because I had, how should I say, a parcel of land there in the mountain. I worked there and I saw how beautiful it was and I used to go there and it was much better. Like I said before, it was cleared and we cultivated there and everything. Now they don't let us go there and we don't cultivate the

land, nothing. Because AMITIGRA doesn't let us. Neither of these institutions do. (#208)

In the first place I grew up in the area, I have seen many changes and I have also travelled to various places in the country, I have seen a lot of deserts, many people with problems. And so I think that we are in a rich area here and we cannot permit it to be destroyed. Due to this consciousness that I have acquired on so many trips I have become aware because I have seen the results in other communities. What happens is that one learns this and puts into practise through community organisations, one is a leader, has to teach the people and at the same time demand that we change our behaviour. And so one serves as an example, that is sometimes like an experiment for the community, and many of these people nowadays are changing their position. Through these organisations that we have like water committees, parents societies, like groups including football clubs, and so all these people start having another type of thought. And so one has to be a leader and serve as an example for the people so that they see that what one wants is change. (#401)

Because I am a campesino. I teach myself as a campesino from here. And so one has to use logic in what is good and what is bad. (#211)

People also spoke about learning about the forest and the park from family members, mostly parents but also children and spouses who either learned things through experience or from other sources.

Me, above all else from my parents. They have established a base, a foundation because my parents have dedicated a lot to cultivation and they have focussed a lot on caring for the forest, the trees. (#205)

From childhood they taught me, we used to clear the fields but we left the big trees, like the guava, the guava trees, all the big trees that serve to provide shade we didn't cut. Only the brush. And so they taught us that trees are life. And they taught us biblically that the tree is life and they are God's creations also. It is something that God has left us. (#505)

In the same way sometimes we listen to the radio and my father has received various seminars and so he explains to us. (#502)

Learning about trees and forest conservation in school was another important source of knowledge given by residents in LTNP.

One, from when I was small they have taught me that if you cut a tree you must plant another one but in an area where it doesn't affect us. But in school they instructed us a lot that cutting the trees, no, or that one must plant others, always leave something. And in school I have received teachings about the environment and in the university too. (#207)

Well in school they always teach this. Mostly in school they teach it because one's parents don't really know much. (#108)

Only 17% of respondents said they had obtained this knowledge from AMITIGRA, a program through AMITIGRA or working for AMITIGRA, although it was not often the first source that people mentioned.

Due to the seminars that I have taken with AMITIGRA that have been about this, the forest. In reality, working with people, making them understand how important nature is. Due to this, it is where I have learned and in exchange I try to give the same to others. That we should care, although like I said before there are people who are negative about this, that they have come to take what is ours. And so that is where I have learned. (#107)

Well, we in the sense that we see, we ourselves notice, we can grasp schooling ourselves. That's true. And like I said we have had a lot of closeness with Recursos Naturales and AMITIGRA too. (#307)

In the first place one already has Christian knowledge. And that there is the Fundación AMITIGRA that also has given us awareness. (#302)

Other sources of knowledge mentioned were: community organisations (such as town councils or agricultural cooperatives), workshops (it was unspecified whether these workshops were by AMITIGRA or other organisations), church or bible, television or radio, other people in the community and personal study.

In these responses no one specifically mentioned park guards as a source of information. This lack of associating park guards as sources of information as well as the association of park

guards as law enforcement (see section 5.3.7), indicates that guards are having little effect at promoting environmental knowledge in the communities.

5.3.9 AMITIGRA Program Participation

Environmental education and creation of programs to aid the development of communities are both objectives of AMITIGRA. Such programs are usually intended to increase the knowledge of park residents and change their attitudes about the park and conservation (Barton 2001). In key informant interviews managers mentioned thirteen ongoing or past programs or projects with communities in the park. These were:

- Water project (PRRACAGUA).
- Greenhouses for small commercial flower sales.
- Fuel efficient stoves.
- Sustainable or organic agriculture training.
- Consultation in management plan.
- Participation in park management evaluation.
- Nature tour guide training.
- Infrastructure improvements (roads, schools).
- Tree nursery.
- Invitations to meetings for the payment for environmental services initiative.
- Reforestation.
- Training.
- Employment.

Despite only 17% of respondents listing AMITIGRA as a source of knowledge about forests and conservation, forty-nine percent of respondents (n=26) said they had participated in a program or project with AMITIGRA and 51% of respondents (n=27) said that they had never participated in a program or project (Table 5-13). However of this 51%, 7 respondents mentioned an AMITIGRA led project or program elsewhere in the interview, although the connection to AMITIGRA was not always made. In total 62% (n=33) of respondents mentioned being involved in program or project at some time in the interview.

Table 5-13 Participation in AMITIGRA Programs or Projects

Program or Project	Number of Respondents¹	Percent of Respondents
Seminars or training	14	26%
Fuel efficient stoves	12	23%
Reforestation	8	15%
Water project	7	13%
Re-building of the community (Juncales)	6	11%
Fire fighting	3	6%
Interaction at festivals	2	4%
Sustainable agriculture program	2	4%
Construction of a chicken fence	1	2%
Employment	1	2%
Garbage clean up	1	2%
Payment for environmental services initiative	1	2%
Talks in the school	1	2%
Tree nursery	1	2%
None	27	51%

¹n=53. Responses missing in two interviews.

Respondents mentioned being involved in a total of 15 programs or projects both in response to the direct question and in other areas of the interview. The most frequently mentioned projects were training or seminars in the community (26%) and receiving a fuel-efficient stove (22%). Other projects mentioned were reforestation, the water project, rebuilding of the community (Juncales was relocated and rebuilt with help from AMITIGRA after being

destroyed by Hurricane Mitch in 1998), firefighting and building of fire breaks, participation in festivals, sustainable agriculture program, construction of a chicken fence, current or past employment with AMITIGRA, garbage clean up, meetings related to the payment for environmental services initiative, a talk in school and the tree nursery. No-one mentioned consultation in the management plan or the park evaluation, the greenhouses or infrastructure improvements which were all mentioned as successes by managers.

Some projects, particularly the fuel efficient stoves and the water project (PRRACAGUA) were spoken of very positively by residents. However it is interesting to note that although many people mention the benefit of the eco-stoves only four people mentioned use of an eco-stove as an action to conserve resources (see section 5.3.5) indicating that the connection between the new stoves and conservation was not clear.

The eco-stoves are for- They are really nice because they have a metal top, they have a type of pan, and the opening is very small. And because of that it really saves firewood. I personally, I here used to use a lot, 30 or 40 sticks. Now I'm using 5 sticks a day. And they are not stick, they are twigs that I go and find on the road. I rest, my husband rests and the fire serves us, we don't breathe smoke, we don't swallow so much smoke anymore. AMITIGRA helped us but they didn't complete the project. Now the municipality is in this project too, finishing the stoves where houses are missing them. It is also to protect but this helps us a lot. (#101)

Well look, here were some very beautiful days, in reality, when those from PRRACAGUA were here. It was so nice, a really beautiful organisation, organised committees. It was really beautiful. And it brought control, well, with everything to do with the environment, health, everything went so nice. But now, I don't know what to say. Only the municipal representative, the town council, I don't know what happened to that committee. (#102)

It was also common for people to mention a program or project that they had been involved in and note that they were not sure whether AMITIGRA was involved or if it was other organisations or that once the project officially ended they felt that the support of AMITIGRA also ended, as expressed in the quotes above.

Sixty-seven percent of the residents interviewed in Juncales mentioned the aid received from AMITIGRA in rebuilding the community after it was destroyed by Hurricane Mitch in 1998. This aid was often mentioned as the first contact the community had with AMITIGRA which established the foundation of the relationship with them.

And so what happened is that people were left adrift they had lost everything they had, their houses, and so we asked for help from AMITIGRA. And, well we asked them for help and thank God, they offered help. And this is how it has gone, perhaps, constructing this community little by little. (#307)

They were a fundamental part in making this community exist. We worked with them. They gave part of their funds, and the Rotary Club and other world institutions helped to construct the community channeled through AMITIGRA. And so they put in a part and we the other part to make this community exist. And so from there we learned who is in charge of the park. (#309)

Even when people talked about being involved in a program or project, some people mentioned that they felt they were not effective or appropriate for the community.

They had meetings, meetings more for awareness about the forest, but not help, aid programs, none that I am aware of no. Or in few words, I believe that we could pass days talking about the same thing and they have not brought any benefits, from what I know AMITIGRA, no. (#212)

Yes on certain occasions, sporadically, they have come to give talks in the school. Or, they are talks as in you come for an hour and say to the children “care for the environment” and that is it. No, this is not giving a talk. (#201)

Projects and programs by AMITIGRA in the communities help build relationships with residents however the idea that once the project is over there is little additional communication as well as the lack of connection of projects with AMITIGRA may reverse this relationship building. Additionally the apparent lack of connection of environmental knowledge with AMITIGRA programs (see section 5.3.8) indicates that programs are not effective in sharing environmental knowledge and values between the organisation and the communities.

5.4 Discussion

Results related to knowledge and awareness of the environment, conservation and management of LTNP show a general understanding of environmental change and basic conservation concepts such as the definition of a protected area and the necessity of protection for forest conservation. Throughout the interviews it was common to hear what Strauss (2005) terms “verbal molecules,” expressions which appear to be superficial and to not be broadly incorporated into people’s thoughts and actions. Phrases in the interviews such as “without forest the area would be a desert” or the park as the “lung of Tegucigalpa” were often used to express people’s knowledge of the environment and conservation. Schelhas and Pfeffer (2008) found similar verbal molecules including forests as life, forests as sources of water and protection from desertification and forests related to clean air and cool climate. The authors suggest that these ideas are sometimes only repeated ideas from environmental education or media and reflect what people think they are expected to say. However they also suggest that these ideas may also become accepted values and represent a foundation used by residents to build more in-depth and complex views of forests and conservation. The results of this study indicate that a combination of the two explanations is in effect. Although people express the responsibility of the community to conserve the forest, this is not necessarily translated into action. People attribute their knowledge of forests and conservation to life experience and family rather than outside organisations or media indicating that they consider this knowledge and values as their own.

Results on residents’ understanding of conservation also indicate an adaption of conservation knowledge to fit local context and values. In Cerro Azul Meambar National Park, Schelhas and Pfeffer (2008) found that residents integrated conservation and livelihood values and redefined conservation concepts to meet their livelihood needs. For example, in LTNP

deforestation and its effects were seen as negative and protection of the forest as necessary to avoid deforestation. People often mentioned a change in agricultural practices such as burning or greater consciousness of the community as resulting in more forest, indicating incorporation of wide-spread or global conservation values. However, adaption of these concepts in order to maintain local practices was also common. For example, loss of forest was often perceived as being caused by other communities or outside forces such as natural changes and few people recognised their own actions or livelihood practises as being causes of deforestation. A similar adaption of conservation values into local livelihood practises was the consideration of planting fruit or other non-native trees as reforestation. Although not generally thought of as a conservation activity the concept of reforestation was adapted to include livelihood activities.

More specific knowledge related to La Tigra National Park was less complete. Similar to results found in the literature, residents had a high awareness of the existence LTNP but knowledge of zone boundaries, management structure and objectives was not as clear. This lack of knowledge, combined with residents' view that knowledge was gained by life experience and the lack of connection of programs with AMITIGRA and their conservation objectives, indicates that management activities and programs are not very effective in raising awareness or creating a forum for discussions about management of the park. The paucity of this park specific knowledge often led to confusion of regulations and management structures which may delegitimise activities of AMITIGRA and create problem between communities and management. These issues are discussed further in Chapter 7.

Chapter Six: Results on Benefits of the Forest and La Tigra National Park

6.1 Introduction

In this chapter I discuss results related to benefits of the forest and of La Tigra National Park (LTNP). To understand residents' perceptions of the forest and of the park I asked what resources people used from the area, what the importance of the forest was to them, what benefits they received from the park, if there were benefits of AMITIGRA managing the park and who benefited from the park. I use this information to discuss residents' relationship to the park and its resources and gain an understanding of how the park is perceived.

6.2 Background

Many studies on local people's relationships to protected areas have focussed on the issues or conflicts arising from perceptions of incompatible land uses such as resource extraction or damage to crops by wildlife (Allendorf 2007). However, perceptions of benefits can also influence attitudes towards protected areas and conservation behaviours (Allendorf et al. 2006, Alexander 2007, Allendorf 2007, Vodouhe et al. 2010, Sarker and Roskaft 2011, Allendorf et al. 2012). It is often assumed that increased perceptions of benefits will lead directly to more positive attitudes towards protected areas; however, promising economic benefits can also raise expectations that can be difficult to meet, causing dissatisfaction, and negative feelings toward the protected area. On the other hand, non-economic benefits often require less outside inputs and may strengthen the relationship between residents and protected areas (Pfeffer et al. 2006, Allendorf 2007). As such although economic benefits to local communities are an important factor in people's perception of conservation, economic aspects do not capture all of the factors influencing the relationship that people have with protected areas (Allendorf 2007).

Many studies have focussed on the importance of economic or extraction benefits received from protected areas; however, results of recent studies of benefits of protected areas show that local people value protected areas for a range of reasons. Perceived benefits of forests and parks broadly fall into five general categories:

- 1) Economic benefits such as income generating activities, infrastructure or financial incentives from management activities.
- 2) Extraction benefits of resources such as timber, firewood, game species or edible or medicinal plants.
- 3) Ecosystem services including water, air, climate and soil.
- 4) Esthetic benefits such as tranquility, the beauty of the area and recreation.
- 5) Conservation values such as existence of wildlife or conservation for future generations (de Albuquerque and de Albuquerque 2005, Pfeffer et al. 2005, Schelhas and Pfeffer 2005, Allendorf et al. 2006, Allendorf 2007, Baral and Heinen 2007, Gareau 2007, Silori 2007, Durand and Lazos 2008, Schelhas and Pfeffer 2008, Alkan et al. 2009, Durand 2010, Schelhas and Pfeffer 2010, Vodouhe et al. 2010, Sarker and Roskaft 2011, Allendorf et al. 2012).

Understanding local people's perception of benefits is important for understanding their relationship to the environment, attitudes towards the protected areas and value of forests and conservation and how these can be integrated into park management.

6.3 Results

6.3.1 Resource Use

The use of natural resources is one of the key factors in the parks and people dilemma. Local people around the world rely on resources in protected areas including wood for houses, fenceposts and firewood, edible plants or animals, clay soils for house building, grasses for livestock, water for drinking and washing, and resources for medicinal and ceremonial uses (Barton 2001, Gareau 2004, de Albuquerque and de Albuquerque 2005, Baral and Heinen 2007, Silori 2007, Schelhas and Pfeffer 2010). Although this resource use provides a direct connection of residents to their environment, the use of these resources in an unsustainable manner can degrade the natural environment and cause concern for formal conservation management (Gareau 2004, Gavin et al. 2007, Jimenez-Castro 2008).

To understand the direct relationship of residents of LTNP to the forest, I asked what natural resources residents used from the area. Residents mentioned ten natural resources in response to the direct question and in other areas of the interview (Table 6-1).

Table 6-1 **Reported Resource Use of Residents of LTNP**

Natural Resource	Number of Respondents¹	Percent of Respondents
Firewood	49	89%
Wood for construction of houses, stoves, furniture and fences	23	42%
Water	16	29%
Land	8	15%
Air	6	11%
Leaves and brush for compost	3	5%
Live trees for shade and soil protection	3	5%
Soil for adobe bricks	2	4%
Pine cones for fire starter	2	4%
Medicinal plants	1	2%
Nothing	1	2%
¹ n=55		

The resource most often mentioned was firewood (89%, n=49). People often emphasized that they only collected dry or dead wood and did not cut live trees for wood.

Like I was saying a while ago, there are dry trees that are no longer alive. We use these for the stove. Also pine, yes sometime we use it for cooking. (#303)

Look what I use most from the forest is firewood. But I'm not saying live trees. I am not going to go and cut down a tree, well unless it has fallen or that they tell me that I can cut this tree and take it. (#404)

People also noted that they collected or cut wood from their property or from the buffer zone so as not to damage the forest.

I think from the forest forest no, nothing, only water, the water that comes from the forest, from the mountain. We use firewood but always from the buffer zone. No one goes to the mountain to get it, only from the buffer zone. (#505)

Look I don't go to the mountain to take anything. I don't use anything. They kick out anyone who goes in there. Firewood from no further than here, from the garden, or if not there is a neighbour who we buy from. And if not, from trees that are drying out. (#503)

This idea of collecting firewood in the buffer zone not the core zone may indicate the perception that the buffer zone is not part of the park or that is understood to be an area with less restrictive regulations and allows for sustainable use of resources. This reflects the understanding of different conservation objectives for these two areas.

Residents often spoke of the use of resources with regret and said that they used firewood because they had no other choice.

And unfortunately, the firewood we care for but, well, what we use most from the forest is firewood because we don't have an electrical system or electric machines we feel obligated to do this. (#110)

Well from the mountain, like you said, from there we use or we need firewood for the stove. We are not going to take it from our roofs or anything. (#202)

I know it is not good but one's situation, campesino, that has no means for energy has to do it, right, get wood. (#304)

In Cofradía it was common for people to admit that they used firewood but that they believed that it was illegal to do so.

Firewood. Here the wood that is drying out. Like I said, one has to be clear, in secret because if they see you they take you to prison. (#212)

Although it is illegal to cut live trees or standing dead trees, collecting fallen dead wood for firewood is allowed in the buffer zone of LTNP. The lack of effective communication between managers and residents on park regulation, particularly in Cofradía, creates problem as people believe that even their most basic needs are denied and they are forced to conduct illegal activities (see Chapter 7).

Forty-two percent (n=26) of respondents also recognised their use of wood for other activities such as building houses, stoves, furniture and fences.

Because sometimes, as we say, a pine tree, sometimes one needs to construct a house, a stove, something like that and if one has this tree they would go and cut it and would use it right there. (#206)

Here what we have is broad leaved forest. In the lower areas, around Cantarranas, there it is, because it is a pine type. That is what is needed most for construction, to make chairs. And so it is necessary. To use them to have the basics or for construction of houses which is what one is most used to here. But it is not much. (#501)

It was also common for people to indicate that they understood that unregulated cutting of live trees was illegal and that they either sought permission to cut live trees for construction or in cases of emergency (such as damage to one's house) did so illegally (see Chapter 7).

Other resources people mentioned using were: water, land, air, leaves and brush for compost, live trees for shade and soil retention, soil for adobe bricks, pine cones for fire starter

and medicinal plants. Only one person said that they did not use any natural resources from the area.

The open-ended interview method for collecting this information produced results related to which resources people recognise as natural resources they use from the area rather than a representative list of what natural resources are actually used. For example AMITIGRA identifies adobe brick (made from clay soil and pine needles) as the housing material for 93% of El Carbón, 74% of Cofradía, 60% of Jutiapa, 52% of El Rosario and 31% of Juncales (AMITIGRA 2006); however, only two people mentioned soil for adobe bricks as a resource that they used from the area.

6.3.2 Importance of the Forest to Residents

To understand residents' perceptions of the importance of the forest to them and the benefits they gain from it I asked if the forest was important to them and for what reasons. All residents considered the forest important to them and all but one articulated benefits from the forest. In total respondents mentioned 13 benefits of the forest (Table 6-2).

Table 6-2 Perceived Importance of the Forest

Importance of the Forest	Number of Respondents¹	Percent of Respondents
Water	34	63%
Air	31	57%
Cool climate	22	41%
Erosion and flood control	8	15%
Health	5	9%
Beauty	4	7%
Firewood	4	7%
Wood	4	7%
Rain	3	6%
Compost	2	4%
Shade for crops such as coffee	2	4%
Wildlife	1	2%
Future for our families	1	2%
¹ n=54		

Water was the most mentioned benefit or reason for importance of the forest (63%, n=34). This benefit included both quality and reliability of water for drinking and household use as well as water for irrigation. Schelhas and Pfeffer (2008) in Cerro Azul Meambar National Park, Honduras found people viewed retention of forests, particularly around specific areas such as streams, as keeping the flow of water in place. Residents of LTNP expressed similar associations.

For the same, because like I said they give many benefits. Every day we have water. Without forest we wouldn't have water. That is why forests are necessary. (#104)

Because the forest helps us, more than anything the water, because we need water here and not only for our own consumption but for the crops as well. (#307)

It is practically the means of life. Because nature supplies us with everything, air, water, all the resources. Most importantly the water resource, one could say is the most important here in this community, the water resource. (#309)

There are communities that I have seen, I have seen that they have changed differently than here and so the people suffer with the time of water. The water becomes scarce and unfortunately when it is winter they have to drink water with mud. Because the waters,

what runs is mud because of the water sources and so what arrives at the houses is pure mud. And they have to drink it because there is no conservation. Meanwhile if we maintain the forest, the forest acts like a sponge. The sponge absorbs everything. And so the water here doesn't drag mud, because it maintains itself like a sponge. The water doesn't run directly gathering dirt, rather it runs through the leaves, through the mosses and so when it arrives at the source it isn't carrying dirt. It is like a sponge, it absorbs, there is filtration. And in those places there is no filtration. You wouldn't believe, look, when I am there in the winter, I carry my water from here because if I get it there and put it in a glass it is yellow. (#507)

Air was also an important forest benefit recognised by residents (57%, n=31) and considered an essential part of life.

They are the source of life. Because without trees we couldn't even breath because through the air you breath. It is a source of oxygen. (#205)

They are our lungs, through them we breathe, what else can I say? For me trees are very important because through them there is life. (#104)

Although air is a less tangible benefit than other forest resources, it was often described by comparing the air quality in the forest to that of the capital city of Tegucigalpa. It is likely that the generation of clean air or oxygen by forests was learned from an outside source, but the expression of how this applies to one's life indicates that it is an idea that is accepted and valued by residents.

Because imagine that here we, well we could say for example those that live in the city don't have clean air, it is polluted air. If we live here in the mountain all these trees generate clean air for us. (#303)

The tree, this, gives oxygen. It gives life because we live from oxygen that the trees give. If we didn't have oxygen perhaps it would be like in the capital city where they only breathe polluted air, to say the least. (#402)

The third most mentioned benefit of the forest was a cool climate (41%, n=22). This was expressed as coolness provided by shade at a small scale as well as overall cooler climate in forested areas.

If you sit close to one of these (trees) what you feel is a great coolness and if we are here like we are, what we feel is the sun. (#209)

I consider that yes because imagine that many times we go to places where you can't find a tree, they don't give us shade, the sun tires us and we can't find anywhere to hide ourselves. Or you could say for humans the tree is life. (#107)

If you go to where there are no trees you feel the heat. But we go to the mountain and everything is cool. This represents life because heat is part of the crisis of the body. (#110)

I would say that I am happy to be here, well for the climate, and this climate that we feel here is because of the forest, this is what I receive. The health that I have right now is because of this oxygen. And from there remember that from there one even earns their tortillas. And also the forest fixes the soil with its roots. (#412).

Other benefits of the forest mentioned were: erosion and flood control, health, beauty, firewood, wood, rain, leaves and brush for compost, wildlife and shade for crops such as coffee.

It was common for people to express the benefits they gained from the forest by using the concept of “life” that forests are life, without forest there is no life or trees provide life.

Because trees are part of our lives, it is something that gives one life. In part because, for example, the water is pure, we use firewood and many other factors. (#204)

Well speaking of the forest, for us it is a source of life. Or you could say that it serves us in that it give us oxygen, water and is something very, but very essential and important. (#505)

Schelas and Pfeffer (2008) found similar cultural models or values in Cerro Azul Meambar National Park, Honduras and suggest this may be a verbal molecule (Strauss 2005) taken from a past state forestry corporation COHDEFOR slogan of “the forest is life, without forest we will not have life.” However given that in most statements people provided examples of benefits and how the forest was important for their life I suggest that, as with other verbal

molecules heard in the interviews, that people have internalised this slogan and view it as a forest value. But some respondents also questioned these verbal molecules.

With respect to what they say that the forest produces a lot of water I am not really in agreement with that because this area has not been very rich in water. The streams have always been very poor. And so if I took you to the forest, to the wilderness as we say, where there is hardwoods there should be an abundance of water, not like in the Rio Plátano in Olancho, here it is very poor in this. (#212)

Although here in these mountains, I am going to tell you something, here many people say that this water comes because there is a lot of forest but it is a lie. I will tell you why, because here my parents worked and my grandparents and they were miners. In those times, when they were miners, there wasn't forest here rather the mountains were bare because, you know where there is a company there are houses and they had cut down the wood and everything. But my grandparents told me and my father told me, they said that from this mountain a stream springs up to all the creeks that are here. My father used to tell me that rather the water came up to the top, that since these mountains are so perforated with so many mines inside, my father said there used to be a field inside as big as a stadium where the miners rested. And there in the middle of the mountain there was a field where the water flowed up from in this mountain. That no one knows where this water comes from. (#504)

In the first case the community where the respondent lives is in the lower areas of the buffer zone where the climate is dryer and water shortages are more frequent and therefore the direct connection between forests and water is not as concrete as in communities near the cloud forest which visibly collects water. The second quote above expresses doubt that the forest has any effect on water production because of evidence of water inside the mountains. These responses show the potential use of verbal molecules and water conservation education being modified to local perceptions such that it is rejected by residents.

6.3.3 Benefits of the Park

To understand residents' relationship with the park it was important to distinguish the perceived benefits of the park from benefits of the forest in general. To this end I asked people

what benefits they received from living in or near the park. Seventy-five percent (n=41) of respondents said that they received benefits from living in the park, although two residents did not specify what they were, and 25% (n=14) of respondents said they did not receive any benefits from the park. Respondents mentioned a total of 15 benefits of the park (Table 6-3).

Table 6-3 Perceived Benefits of the Park

Benefit of the Park	Number of Respondents ¹	Percent of Respondents
Water	21	38%
Air	12	22%
Employment for self or community	10	18%
Cool climate	8	15%
Aid projects	5	9%
Health	4	7%
Land	4	7%
Control	3	5%
Beauty	2	4%
Firewood	2	4%
Erosion control	1	2%
Infrastructure	1	2%
Rain	1	2%
Wood	1	2%
Life	1	2%
Unspecified	2	4%
No benefits	14	26%
¹ n=55		

Fifty-one percent (n=28) of residents recognised the benefits of environmental services from the park such as water, air, cool climate, erosion control and rain. This was much lower than residents perceptions of benefits from the forests where 96% of respondents (n=52) mentioned environmental services as benefits of the forest. People expressed these environmental service benefits of the park similar to how they expressed them as benefits of the forest.

Well in the first place it guarantees us water production, the environment, well, is fresh and all the natural richness that there is in the park is a well-being for the communities. (#401)

More than anything I receive pure air. I receive pure air and I feel secure. Because I have lived in the city and the city isn't good. You know that in the city they don't breathe this air, no, only polluted air. And so for this I say that yes it is a benefit. (#110)

That here at least it is an agreeable climate. Few illnesses due to the freshness there is here. And so to me it seems that this is a good environment. We achieve this freshness from La Tigra around here. (#109)

Economic benefits were also recognised as benefits of the park. These were employment benefits (18%), aid projects (9%) and infrastructure (2%). Employment benefits were described as not just personal employment but benefits to only those who worked for the park or benefits to the community in general.

Yes there are benefits because tourists come and so one sells; if you have a little business one sells things. (#502)

There are many, one is that this is a touristic zone, tourists visit, and well tourism leaves behind money. But unfortunately here there isn't really this opening that comes because the majority of the tourists visit other areas of what is La Tigra National Park, in this area here of Rosario, it isn't very visited. It is little. What is, is the area of Picacho. (#505)

Only for those that work it is a benefit, from there, for everyone else, no. (#506)

At least I think so. The only thing would be that one has to do is educate themselves in the sense of using what is inside the park and also the people that visit the park as tourists. And so there are many benefits that maybe one doesn't exploit because they don't have access to some knowledge. (#401)

Although Jutiapa (the area of El Picacho) receives the majority of the tourism and employment as park guards or hotel staff, both Jutiapa and El Rosario receive some tourism and employment. There are also a few people employed in El Carbón and Cofradía as park guards and tree nursery employees. Despite this, nine of the ten respondents who identified employment as a benefit were from El Rosario and only one was from Jutiapa. Additionally, two park guards

and one family member of an employee who were interviewed as residents of their respective communities did not mention employment as a benefit of the park.

Projects or aids¹ were also mentioned as a benefit of the park including projects through AMITIGRA and other organisations. All the respondents who mentioned projects or aids as a benefit of the park (n=5) were from El Carbón.

Yes because we have had benefits. Because we had a water project not that long ago. A time came when the water didn't come regularly anymore. And so AMITIGRA through the European Union helped us get a new project. It is a good project. (#106)

In the first place the benefit that I get is that when help comes from the organisation that cares for the park. The institution is always here for the care of the communities. Because you know that without an institution... an organisation has to have good communication with the communities, so the communities support the care of the park. The benefit is that there is no shortage of water anymore because we are a low area where it occurs or where the water comes from. Yes we have big benefits. Here from the mountain, the air that we receive is not polluted air. You would realise if you go to these places, you go up to a hill to breathe the air, you see how the trees move. This is something precious. And so there is a big benefit. (#107)

Yes because of the aid. Yes because here at the level of this park they obtain aids. Well, here they came with new floors for the houses. From there, through this, not money from AMITIGRA, it came from other places. They say that is how it is. (#103)

Other benefits of the park mentioned were: health, land, control, beauty, firewood, erosion control, wood and life.

Although all residents perceived benefits of the forest, 26% of respondents said they received no benefits from the park and another 4% said that although they received some ecosystem services benefits they did not receive any additional benefits such as economic benefits from the park. In total 30% of respondents mentioned that they did not receive benefits or additional benefits from the park.

¹ Projects were often referred to as “ayudas” or literally translated “aids.”

Well for us here, there are no benefits. (#306)

There are no direct benefits. There is nothing that they come and offer us like “well for protecting this you have the right to do this in the watershed, you can plant that.” No, there isn’t anything. Benefits that I am aware of and that I can live or can see, you don’t need glasses to see what is in front of you, there is nothing that benefits us. (#207)

Economically none or really for living, or perhaps I benefit directly from it because the water is much better, we have a pleasant climate, there isn’t much pollution. That one could say it is a direct benefit. (#510)

Because we can live well in that we breathe well, breathe well, drink healthy water but there are no sources of work at all. Economically we have nothing back from La Tigra. (#403)

The majority of respondents who said they did not receive any benefits from the park were from Cofradía (59%) and Jutiapa (33%). All respondents from El Carbón indicated that they received at least one benefit from the park. These results are congruent with results from Cerro Azul Meambar National Park (CAMNP) where Schelhas and Pfeffer (2008) found that most people recognised the general benefits of the park and forest conservation but did not think they received specific or tangible benefits. The lack of perception of benefits from LTNP, particularly in Cofradía and Jutiapa, is problematic for gaining support of the park from the communities and for developing a working relationship between the residents and AMITIGRA.

6.3.4 Benefits of AMITIGRA Managing the Park

Perceptions of park management can influence residents’ perception of the park and relationship with management. To better understand the relationship between the residents of LTNP and AMITIGRA I asked residents if they thought there was a benefit of AMITIGRA managing the park and if so what the benefits were. Fifty-one percent of respondents provided at

least one benefit of AMITIGRA managing the park and 49% said there was no benefit.

Residents identified four benefits of AMITIGRA (Table 6-4).

Table 6-4 Perceived Benefits of AMITIGRA

Benefit of AMITIGRA	Number of Respondents¹	Percent of Respondents
Protection of forest and resources	23	43%
Projects	7	13%
Employment	4	8%
Tourism	1	2%
None	26	49%

¹n=53. Response missing in two interviews.

The most commonly perceived benefit of AMITIGRA managing the park was that they provided protection of the forest and natural resources such as water (43%, n=23). These responses were similar to responses related to what would happen if the park was no longer protected (see section 5.3.5) as many people believed that without the protection of AMITIGRA the forest would be destroyed.

Well the benefit that we see directly is that it guarantees that they are responsible all 364 days of the year for protection. And so we see that 100% they try to carry out the promise they have for protection. (#401)

A benefit in that the forest grows more and the sources of water don't dry up because if they didn't care for the core zone there wouldn't be water. (#106)

Well like I said we depend on the national park for the tourists that come. It makes no difference to me if AMITIGRA protects or another organisation, but yes it is necessary that the park is protected. (#509)

Like I said for me, AMITIGRA, personally I see them as good because like I said, if there wasn't anyone here watching out, the people could do and undo. And so people from other places would come and we would be left with nothing. And in part I agree with AMITIGRA that they implement a bit of order because like we say, even we would be left with nothing. People from other places, if there wasn't anyone to tell them or stop them people would see that they could come, people from other places, and destroy. (#307)

As with benefits of the park people also mentioned projects as a benefit of AMITIGRA managing the park. Unlike the identification of projects as a benefit of the park where all responses were from El Carbón, people from three communities viewed projects as a benefit of AMITIGRA.

AMITIGRA, it is because they are people that have visited this community a lot. We thank them very much, they have helped us, they have helped us with water, with the water project. (#101)

But yes it is important because there is always someone to help and to say “Here we are as an organisation.” Because we have thought alone all the time. But how beautiful when someone came and said “We are bringing this program and we want to come together.” And we have united and there we go, pushing the cart. (#507)

For the aids that they have given us. They have always taken into account El Carbón, the community, they have helped us... They have helped us a lot. Unfortunately there have been some errors that the community revels in because it is difficult to complete everything... For me, speaking for my community, the benefit is that we have someone to present oneself to, that there has been an organisation that has control, we know where to go when we need a project within the protected area, one goes to the Amigos de La Tigra. First one goes to La Tigra. (#107)

Although people mentioned benefits of AMITIGRA, almost half of respondents (49%) said there were no benefits to AMITIGRA managing the park. Although respondents in all communities expressed this idea, as with benefits of the park, people in the communities of Cofradía and Jutiapa were most likely to indicate that they saw no benefits in AMITIGRA managing the park. Forty-four percent of respondents in Juncales also believed this. The lack of benefits largely related to the lack of economic benefits and the lack of community involvement and communication.

None. I believe that the only benefit in the community is that we take care of each other, between ourselves. Know what is good and what is bad for the community and we, as representatives of the community, know the needs. Other people from outside are not going to know what our needs are. (#205)

Well that AMITIGRA cares for here, as it is, no, I don't believe there are any. They don't even come and present themselves so that we can have a dialogue. As a community there are no benefits. It doesn't favor us in anything. (#207)

AMITIGRA totally does not do anything for the community. They don't do anything because we are on the opposite side of the park. (#505)

For them yes, but for us no... All the aids that come, they grab. And the communities, very little. And sometimes if they give, then we don't even realise it. (#406)

The lack of perceived benefits to the communities, and Cofradía and Jutiapa in particular, indicate a negative view of park management by these residents. These results suggest that issues between the community and the park are related not only to conservation and livelihood conflicts but also related to management and who is seen to benefit. These residents are less likely to support initiatives of AMITIGRA in the park or the communities. These issues are discussed further in Chapter 7.

6.3.5 Beneficiaries of the Park

People recognised benefits of the forest, the park and even of the protection offered by AMITIGRA. Although these perceptions of benefits indicate that people feel that they in some way benefit from conservation of the area, it does not necessarily mean that they see themselves as the prime beneficiaries of the park. To better understand who the beneficiaries were perceived to be I asked residents who benefits from the park. Residents identified 11 beneficiaries in both reply to the direct question and other areas of the interview where people specifically mentioned someone benefitting from the park (Table 6-5).

Table 6-5 Perceived Beneficiaries of the Park

Beneficiaries of the Park	Number of Respondents¹	Percent of Respondents
AMITIGRA	25	46%
Communities	24	44%
Tegucigalpa	8	15%
Everyone	6	11%
Government	5	9%
Oneself	4	7%
Park guards or individual community members	4	7%
Tourists	3	6%
Private institutions	2	4%
Animals	1	2%
SANAA	1	2%
Don't know	3	6%

¹n=54; response missing in one interview

The entity most mentioned as a beneficiary of the park was AMITIGRA. Almost half of respondents (46%, n=25) perceived AMITIGRA either personally or as an institution as benefitting from the park. This idea stems largely from the awareness of grants and funding received by the NGO and revenues generated by tourism without the understanding of how this money is spent or where it goes. Additionally people mentioned that those from AMITIGRA were being paid to care for the park and therefore benefitted from it.

They do, because they come with chests puffed out, “AMITIGRA Park,” and from there tourists come and they charge them, I know how much 150, 250 lempiras. This is for them, to benefit them, the institution, those from AMITIGRA. But now we return to the same, if the town council had a responsible administration it wouldn't be them who received this. (#503)

Those that benefit would be one part Tegucigalpa and another part the institution. And like I said, workers that they have here, they have few but they also benefit... I believe that yes because in the long run what happens, what goes on is that AMITIGRA profits from La Tigra Park. For example we live here, like I said there are some who work here, but I don't know everything that happens, what AMITIGRA does, but they profit, not the community. (#508)

Right now who is directly benefitting is AMITIGRA. Right now. Because all the tourism that enters La Tigra, the park, AMITIGRA absorbs it. (#402)

Well, the benefits, who has them is the institution. From what I was saying, we as a community have failed to be able to send people to be trained to be in charge of administering the park. That would be a benefit for the community because, like I said, AMITIGRA, all the benefits that the community perceives, they don't return even five percent. (#410)

Well they are who benefits. Maybe those that benefit are those that have good jobs. It is not any institution like us, we don't see anything. Those who are favored are the employees that are in AMITIGRA, COHDEFOR, all those. Yes those because they have good salaries. (#208)

People from El Rosario and Jutiapa were most likely to see AMITIGRA as benefitting from the park. All the residents interviewed in El Rosario and 92% of those in Jutiapa mentioned AMITIGRA as a beneficiary. Given that these communities are at the two public entrances to the park it is understandable that this perception is predominant. Residents see AMITIGRA earning revenue from tourism but do not see where this money is spent. Twenty-two percent of the respondents from Juncales and 67% from Cofradía also perceived AMITIGRA as benefitting. In El Carbón no one mentioned AMITIGRA as benefitting from the park. Residents from this community are far removed from tourism activities and also identified projects as a benefit of the park and of AMITIGRA (see sections 6.3.3 and 6.3.4) and therefore they may see a more direct relation between revenues and where they are spent.

Although AMITIGRA was most mentioned as benefitting from the park, almost as many people (44%, n=24) identified the communities as beneficiaries. Reasons for the perception of the community as a beneficiary were largely reiterations of the benefits of the park and forest (see sections 6.3.2 and 6.3.3).

Who benefits from the park? Well up until now, we could say the places here, the communities benefit from the park because it gives them oxygen. This would be a benefit to me. Water. (#403)

Well in the first place, the communities, right, that live around because we are the ones who have direct contact with nature and with the advantage of what the forest produces for us. And so the communities are the first. (#401)

Respondents from Juncuales were most likely to perceive the community as a beneficiary (89%), followed by Jutiapa (50%), El Carbón (50%), El Rosario (45%) and Cofradía (8%).

Tegucigalpa was seen as benefitting from the park by receiving the water and air from the park.

In a big part we do and a bigger part Tegucigalpa because from here, this zone used to give 40% of the water resources, now we are talking about almost 50% of the water resource from just this zone of La Tigra. (#309)

It is interesting to note that although 44% of respondents identified the communities as beneficiaries and people gave many general benefits they receive from the park, very few people identified themselves personally as benefitting from the park. One person described this view of other community members:

Sometimes we can be profiting and we don't realise it. And we say "No, I don't get anything from there." I have heard people, maybe people here that say that the beneficiaries are those from AMITIGRA. And them, breathing the air. (#507)

Other people expressed that although they received these general benefits they did not receive any direct benefits.

The institution. It is they who work, yes because those who are here don't work. The only thing that benefits us is the water. Water is a big thing, but help from AMITIGRA no. That is to say that sometimes donations come and they send them to other areas. (#413)

They benefit even with money and we do not. We who are from here, from the community don't receive anything. (#406)

Other beneficiaries of the park mentioned were: everyone, the government, park guards and other individual community members, tourists, private institutions (likely AMITIGRA

and/or SANAA), animals and SANAA. Three people said they did not know who benefitted from the park.

These results are similar to those found by Pfeffer et al. (2006) in Cerro Azul Meambar National Park, Honduras where people thought of benefits of the park going to other communities or the nation as a whole rather than direct benefits going to themselves. Schelhas and Pfeffer (2005) also found that local communities in Costa Rica perceived that they received few tangible benefits from the park in spite of all the money that was being spent there. In these studies it was common for people to identify park guards as benefitting from employment of the park but the idea that the institution managing the park was benefitting was much less common than in LTNP. The idea that AMITIGRA is the principal beneficiary of the park is troublesome for legitimacy of the institution in the area as well as for creating a trusting relationship between AMITIGRA and the communities.

6.4 Discussion

Residents' perceptions of resource use, forest, park and management are important for understanding local people's relationship with their environment and conservation. Residents mentioned important connections to natural resources, particularly firewood and timber. All people interviewed also recognised benefits of the forest. Consistent with the literature on park benefits residents mentioned all five categories of benefits. Environmental service benefits such as water, air and climate were by far the most mentioned benefits of both the forest and park. Interestingly, conservation values such as wildlife and providing a future for our families were mentioned as benefits of the forest but not of the park.

Despite recognition of resources used, including firewood and timber, very few people mentioned extraction of these resources as benefits of the forest. This may stem from the idea that extraction, even in the buffer zone, was undesirable or even illegal and therefore not a benefit by itself. Additionally most residents of this region are agriculturalists and as such, indigenous forest use, evident in many local communities in national parks, is not deeply ingrained in local culture (Schelhas and Pfeffer 2005). Thus local values in LTNP are likely largely formed through a mix of global and local discourse where extraction values may not be highly touted as environmental benefits.

The most prominent pattern to emerge from the results of perceived benefits was the marked decrease in perception of benefits from the forest, to the park, to administration of the park. Although some people perceived the same benefits from the forest and the park and likely identify the forest as part of the park, many people, particularly in Cofradía and Jutiapa, appear to conceptualise the park as an administrative entity separate from the forest and do not see the same benefits from it. Whereas almost all respondents recognised environmental services as a benefit of the forest, only half recognised these same benefits from the park and 30% of residents said they did not receive any benefits from the park. This lack of benefits stemmed largely from the lack of economic benefits to the community compared to perceived revenues of the park through funding and tourism. This issue is further discussed in Chapter 7.

There was also differentiation between the core zone and the buffer zone. As with responses related to living in the park (see section 5.3.3), respondents showed different conservation values between the core zone and the buffer zone. People illustrated this separation when talking about extraction of resources. For example, extraction of resources from private property or from the buffer zone was seen as a way of decreasing damage to the park. While this

is true when the park is considered only the core zone, and different regulations exist in each zone, it illustrates a higher conservation value for the forests in the core than the buffer zone and an understanding of the regulatory differences between core and buffer zone as intended by this system of park management.

Also evident was the high number of people who perceived AMITIGRA as benefitting from the park. This idea combined with the idea that local communities receive only environmental service benefits and few economic benefits creates mistrust of the organisation and dissatisfaction towards the park and management. The fact that the two communities at the public entrances to the park held this belief more than other communities is consistent with literature that suggests that unmet expectations of economic benefits can create negative feelings towards protected areas (Pfeffer et al. 2006, Allendorf 2007).

Understanding of perceptions of the forest and LTNP and how perceptions of benefits influence attitudes towards the park is important for conservation incentives and management practices that are accepted within the local context.

Chapter Seven: Results of Issues and Conflicts Related to Livelihoods and Conservation

7.1 Introduction

In this chapter I discuss issues identified by residents of La Tigra National Park (LTNP) related to their experience living in a protected area. To compile this information I asked people if they felt there were any problems, or if they were harmed in any way by living in a protected area and what their relationship was with park management. Analysis of these interview data provides a starting point to identify the root causes of antipathy between the communities and the protected area. This information will be used to suggest potential ways to mitigate or alleviate critical issues in order to build a better relationship between residents and management.

7.2 Background

Understanding the benefits and costs associated with people living in or near protected areas is important to creating management structures that meet the needs of both conservation and local people (Karanth and Nepal 2012). Much of the literature on people's relationships to parks has focused on conflicts or issues resulting from the loss of access to natural resources (Badola 1998, Allendorf et al. 2006, Allendorf 2007, Schelhas and Pfeffer 2009, Liu et al. 2010, Allendorf et al. 2012). However, relationships between local people and protected areas are often more complex and context specific (Dearden et al. 2005, Allendorf et al. 2012). Antipathy between communities and protected areas can arise as a result of: prohibition of resource extraction, access limitations, conflicts with management, problems with wildlife (e.g., property damage and depredation), livelihood restrictions, implementation of regulations, failed expectations of benefits, lack of concern for local ecological values and circumstances, land rights, inadequate compensation, power imbalances and exclusion from planning and

management (Oltremari and Jackson 2006, Pfeffer et al. 2006, Allendorf 2007, Gareau 2007, Alkan et al. 2009, Schelhas and Pfeffer 2009, Liu et al. 2010, Vodouhe et al. 2010).

Dissatisfaction with park management can engender negative attitudes towards protected areas or management and lead to illegal activities. Illegal activities may be conducted by people who feel they have no other alternatives to resource extraction or by those who use these activities as a way to protest restrictions or the protected area itself (Badola 1998, Gareau 2007). Forcing people to make this choice between environmental values and livelihood can further increase negative attitudes (Gareau 2007). Schelhas and Pfeffer (2009) found that local people often attempt to reconcile conservation values with other local values and tend to focus on specific issues rather than oppose conservation completely. This suggests that an understanding of these issues can aid in reconciling differences between park management goals and local concerns.

7.3 Results

When asked directly if people experienced any problems living in a protected area or if it harmed them in any way, 60% of people said they had no problems or were not harmed in any way by living in the park. Although many people simply stated they had no problems, others expressed that they did not have problems because they were aware of and obeyed the laws. These responses were likely what interviewees expected that I wanted to hear.

Like I said problems, harms, I don't think so. Maybe at first it is difficult but with time people adapt. And so in the long run there are no problems. People have adapted. (#508)

No, here we live peacefully because no one bothers us or anything. (#406)

The harm would be that, like we say, if I am here and I like to do things my own way, by this I would feel harmed. But in my manner of thinking, to me this vigilance, this care seems good to me. I cannot say that it hinders me because in reality this would be unfair to nature. (#110)

A few people said that they were not harmed but were dissatisfied with some things such as the lack of direct benefits to the community. These responses are discussed further in each issue theme below (sections 7.3.1 to 7.3.5).

Well I am a conscientious person and so it does not affect me. It does not affect me because I respect the laws, respect the rules that exist for these problems, right, because sometimes people have problems because they do not subject to the laws. And so of course in that case it does not harm me. But yes I would like it if they shared the little that comes from La Tigra Park with the community.

Likewise when asked about the relationship between the community and AMITIGRA 53% said their community had a good relationship with AMITIGRA and 47% said the relationship was not good. Similar to the lack of perception of problems from the park many of those that thought the relationship between the community and AMITIGRA was good attributed this to the fact that the community was conscientious and obeyed the laws.

Well with us no, we don't have any problems. In the first place we do not have any problems with the Foundation. We here, directly, one submits to the authorities. (#409)

I don't see many problems. People get along peacefully with them. The people have already adapted, they already adapted. There are no problems. (#507)

I imagine they are good. I have never heard anyone speak badly of the people that are in this institution. And I have never heard that they took so-and-so to jail. Because we are people who actually care about what we have, and really, as far as I know, they are doing a good thing by prohibiting many people from cutting down the forest. Because it is prohibited, they are trying to care for the forest and this protected area. (#303)

People also mentioned cooperation between AMITIGRA and the communities or organisations in the community as leading to a good relationship.

Good. We support them, they support us and we also cooperate with them. (#101)

Well, AMITIGRA sometimes comes to have sessions here with the Water Committee. I believe they get along well, they have communication. (#305)

The predominance of the idea that one does not have problems unless they break the law indicates that people interpreted difficulties as problems with AMITIGRA or the authorities rather than problems that they personally experienced living in a protected area. People who responded that they had no issues living in the park or with AMITIGRA may also have answered in a way they thought they were expected to answer or to hide concern over illegal activities. To ensure perceptions of problems with the park or park management were expressed, other questions were asked in the interview to try to understand the actual costs to residents. The majority of people expressed that they did not have problems living in the park and just over half believed they have a good relationship with AMITIGRA; however, 85% of people mentioned an issue, problem or area of dissatisfaction related to the park or park management somewhere in the interview. Although there is much overlap between issues, I have grouped them into five broad themes: use of wood and cutting permissions, land rights and ownership, land use and livelihood, lack of direct benefits to the community and lack of effective participation and communication. These issues are described below.

7.3.1 Use of Wood and Permissions

Cutting of trees and use of wood is one of the most contentious regulatory issues in buffer zones of protected areas (Barton 2001). The use of wood and the difficulty of obtaining permission to cut trees were mentioned by 60% of the residents interviewed. Given that residents recognise firewood and wood for construction as some of the main resources used from

the area, it is not surprising that obtaining wood is seen as an issue by residents. Residents in all five communities expressed this concern including 92% of respondents from Cofradía, 70% from El Carbón, 69% from Jutiapa, 33% from Juncuales and 27% from El Rosario. Concerns related to the use of wood and permissions were largely related to restrictions on cutting trees or collecting firewood and the cost and process of getting a permit to cut a live or standing tree.

Those who expressed concerns related to restrictions on cutting trees or collecting firewood often talked about the need for wood for house construction or repair and for firewood.

Look for us it is bad. Because I am going to say something without offense or anything like that, but if one cuts a tree it is because he needs it. It is not because he is going to go do something bad but that he needs it for something, for the house or I don't know. But if you are cutting, it is because you need it. But here you get hauled away and ten years is what you get. (#209)

Look, on one occasion I said to those from AMITIGRA "Well it's easy, you say the people can't use wood, this is easy. You just give us the order that we have to go get wood from the sawmill and we won't touch the forest anymore. Why would we touch the forest? Give us an order and you pay the sawmill for the people and the forest stays there." Tell me that isn't the truth? It would be easy but they would have to make an investment and that is what they don't want. They want one to take money from where there isn't any. That is the real truth because here we are talking about poor people. We are talking about poor, poor people that sometimes don't have anything, not even to buy wood. (#212)

People also felt the restrictions on cutting even dead trees were too stringent and that they did not understand why even dry or dead trees were protected.

Well the laws of this zone, we could say, AMITIGRA here had a group here in the town, they are organised, a group of soldiers looking after the forest. And what happens is one sees that when they are around they don't let anyone do things like that. If one cuts wood, even dry wood that is already dead that can be used, they - no. Rather they set an example and I personally have seen them cutting wood. And so I say that is not right. (Interviewer: And how does the community react to this?) Faced with this the community, you can ask me this question after you ask other people that are not here but they will tell you the same, we feel bad. Because they do not let us use something that is already dead and they are using what is actually alive. And so in that part it is bad because from the mountain like you said, we use or need firewood for the stove, we are not going to take it

from our roofs or anything. That is what the forest is for; there is a lot of wood. They say that if there is dead wood, that cutting a tree that is dry is going to harm another. But there are ways to do this so it doesn't harm the other. And if they resolved this part there wouldn't be those who do it in secret, cutting trees to use them. And so if they gave us the ability things wouldn't be like this. (#202)

Here no one can go to the forest and cut. If they hear you chopping they come. Here there is a man in charge of that, if he happens to hear a noise or see a little smoke down below, he is right there taking care. But I don't know why, why if a tree is dry, why you can't use it. (#109)

A few people expressed that they felt there was not much incentive to care for the forest because it provided no utility value.

Because, first when I was president of the town council, some families from here were thinking of cutting this wood. But I opposed and the sawmills came to look for me to say that they would pay me if they could have the chance, permission to cut the wood. And no, look it was a very beautiful forest and I didn't want to take advantage of money in that moment. I don't do that. And so today there is a beautiful forest. But now, however, we say that it practically didn't help us to conserve it because now there is an institution here that prohibits us from cutting a tree for here in the community. We need it but they don't let us cut it. (#208)

For example, tell me, if you are the owner of this property, like I said, and this wood that a family uses, but they don't let you cut it. Even in a garden, a tree that has grown in the garden with big trees, for example. What use does this wood have? This doesn't help us. (#503)

Other people who expressed concerns over the use of wood talked about the difficulty or cost associated with getting a permit to cut a tree. People often admitted that if they could not obtain a permit or did not have the time or resources they cut trees illegally and that this often led to hard feelings towards AMITIGRA.

The relationship is not good for the aspect that sometimes the community does not agree with some situations that AMITIGRA creates. I suppose, well in the aspect that one needs a tree that is on one's own property, you even have to go to AMITIGRA where they authorise you to go to ICF so that a commission will come and inspect you. Or other situations that, including here, many people have even had to break the law for situations of this type. (#410)

But I am going to say something about Cofradía's forest. Cofradía's forest has always been cared for by its population. Look before these institutions emerged, like COHDEFOR, like AMITIGRA, we were in charge of caring for the forest for various reasons. One for the wood that served us for the roofs of our houses, not to sell. Here they have never sold wood. But yes taking wood for the ceiling of the house. It is prohibited now, they don't give us wood. And so many people are using iron, those that can. If not, look how they repair them. Not long ago a lady asked me for some wood for her house where the ceiling was falling down. And I felt bad but I said "What I can do is give you an approval, then you have to go to COHDEFOR, you have to go to AMITIGRA, and you have to go to the district attorney." Someone with few resources doesn't have enough to go in circles like that. "And so I'm sorry but if I give you permission directly, I go to jail. I will give you permission but you have to go get it authenticated." I believe that this lady still has her house like that. (#212)

I am going to mention a case now; I had a small problem when the storm Agatha came and my house fell down. I woke up on Friday, I remember, outside my house, it had fallen down. And at that time, on Monday, I went to the park guards of AMITIGRA to solicit a tree. Always respecting the hierarchies, well like I said, I understand a lot about organisations, I understand about respect, respecting the hierarchies of each person. So I went up to them and I said "Listen I have this and this problem. I need you to collaborate in this part and give me a tree because I don't have time to make adobe bricks and I don't have money either to buy cement bricks. And so I need a tree that I can use to make my house, a place for my kids." And they gave me the run around and said that I had to go to the AMITIGRA office that I had to talk to the managers of AMITIGRA. I said to them "No, you can do it. You have the capacity to do this. And if you need to call them, then I will give you money to call them and we can resolve this problem." They laid out obstacles and when it came down to it they didn't resolve anything. At the last minute I felt so confused, I tell you there are times when one has limits. I felt so bad that I said "Well look, the last thing I am going to say is whether you give me permission or don't give me permission I am going to take one and I am telling you because I don't want you to say anything to me." And so they said "Are you threatening?" "No, it is not that. Don't take it as a threat; it is just that I need it. Look, go see my house, you will realise." They didn't even come. "Go to my house. You will realise that I do this by necessity. It is not for nothing. I need the wood and I come to you because you are the ones in the community who can facilitate a problem. You are the ones who can call there, you have contacts. You can call your boss to come and verify things and you are telling me that you cannot do that. I can't wait a month, two months. My children are outside, or they are somewhere that I don't feel good about." It is true because we were all in a hall but that is never the same as your own house, you understand. And so they didn't resolve anything. And so what I did was I went and took the wood and made my house. Thank God I didn't have a problem but they did not give me the help that I asked for. (#402)

Yes when someone needs something like a pine one goes to AMITIGRA first. They write up a form and from there you go to COHDEFOR, which is now something else. And so from there you go back to AMITIGRA so that they can go see the tree that you are going to use, but this takes time. Including not long ago my oldest son wanted to get a permit. He was going in circles there, went to AMITIGRA, went to COHDEFOR and they told him that he needed 600 lempiras to get a permit. It turned out that he couldn't even get the wood because they said this, that he needed 600 lempiras and so he withdrew. He didn't do anything. And so sometimes one gets mad at them because before we used to go and that was it. One has to go at least three times to get a permit. But here without a permit you cannot do anything. (#306)

Vallejo Larios and Ferroukhi (2005) claim that in Honduras the process to obtain a permit to cut a tree for personal use or firewood includes 24 steps and that this lengthy process creates anger in those soliciting permits and often results in illegal extraction of wood. Schelhas and Pfeffer (2009) found that in both Honduras and Costa Rica people expressed dissatisfaction with the implementation of regulations related to felling trees for subsistence use. However, they also noted that in Cerro Azul Meambar National Park (CAMNP), Honduras, town councils were involved in granting permits and informal agreements were often made to allow people to fell trees for subsistence use without engaging in the full permit process, which reduced much of the tension related to this issue. Barton (2001) also indicated that the use of park guards to facilitate the permitting process in CAMNP was one of the most important services provided to buffer zone residents. In LTNP no such local permit process exists and various trips to the AMITIGRA and National Institute for Forest Conservation (ICF) offices in Tegucigalpa are needed to obtain the proper documentation and approval.

7.3.2 Land rights and Access

During the creation of many protected areas, land or the opportunity to use land is taken away from private landowners without compensation or payment (Schelhas and Pfeffer 2005).

While there is an increasing recognition of the rights of indigenous peoples, the land and resource rights of local communities have received less attention (Borrini-Feyerabend et al. 2004). However, land rights and access to conduct livelihood activities is a common issue for residents living in protected areas (Schelhas and Pfeffer 2005, Oltremari and Jackson 2006, Allendorf 2007, Gavin et al. 2007, Schelhas and Pfeffer 2010, Vodouhe et al. 2010). Concerns related to land rights and park access were mentioned by 33% (n=18) of residents interviewed. Residents in all five communities expressed this concern including 58% of respondents from Cofradía, 38% from Jutiapa, 30% from El Carbón, 18% from El Rosario and 11% from Juncales. Land rights and access issues were largely related to ownership, including land that has grown over and could no longer be worked, confusion and resentment related to ownership of resources on private property and lack of access to certain areas of the park.

Although no land has been officially seized and residents were not relocated when the park was established, residents felt that their land rights have been compromised. This likely stems from the fact that once regrowth on a plot of land reaches a certain stage it is considered to be part of the forest and it is therefore not legal to clear this area, as would be done under traditional fallow system of agriculture. People with forested or treed plots of land feel that this land has effectively been expropriated. This issue is particularly complicated in Cofradía where a group exists that legally owns and manages a large area of common lands surrounding the community including agricultural lands, residences and forest.

The part that I know is the part that is in the real forest. I know it because my grandparents used to cultivate there, but it was taken. They took it from them and now you can't work there. And as we say the mountain is easier for us to work, there in the mountain than down here, because in the mountain there is water. There is a way to take it and irrigate where one is working so that it doesn't just go back to the trees but also to where one is working. And they took all of this. And so now one has to come down here

to work in the lowlands, where it is a dry area. [It rains] only in the winter and if it isn't a good winter we don't have a good harvest. And so in this way it has affected us. (#202)

Well harm, maybe not but the only damage is that although we are owners, now we do not have any power. (Interviewer: And do think that is fair or unfair?) It is unfair because our property is now invaded and they don't pay us. It is unfair because the government hasn't tried to compensate all of these things. That is what we are looking for because the part here that is part of the Commons of Cofradía, it is the same. To see if the government, because now since they don't let us enter, see if they can pay us. From here I believe it has been eight or ten years that we have wanted to see if they can pay us but, yes for more than 16 years I have wanted to see if they can pay me for this property that I have in the mountain. And they have not wanted to pay me. (#208)

Of course it is. I repeat, of course it is necessary. To be able to plant because this is how we live. How is it not necessary? But they don't let us, we would go to jail. For example if there was a sapling of however many inches then people would even- I have a little garden there that I don't even leave shrubs on because although I have ownership papers I don't have anything (#503)

Residents also expressed frustration over the fact that it is illegal to extract resources from private property and that they felt that this compromised their ownership rights.

Yes in truth, more privatized. In the favor of AMITIGRA we could say. Because now one doesn't have the freedom to cut a tree because it is a crime. Well, I agree that wildlife has to be cared for, I agree with that, but not in extreme cases because one who is poor also has needs. And I think they have taken our rights away. (#204)

I'm going to tell you an anecdote, a few years ago they called me from COHDEFOR...they called me because they said the forest was theirs, they said the forest of Cofradía belonged to them, the core zone. I said how was it possible that the forest of Cofradía was theirs if I had the deed, the titles. "No" they told me "it was done by decree." Yes a decree is something but where is the transfer? We haven't sold it, we have no money. And they said that it will be a reserve area and we could expropriate it via compensation. They haven't given us any money. "No" they said, "the land is yours but the forest is ours." "We are good then." I said "We won't argue." He was an engineer. "We won't argue. If the forest is yours and the land is ours, bring the forest here to the city and leave us the land to work." (#212)

Environmental protection is what they call it, environment, wildlife and everything that is related to other people's property. I say other people's because it is not theirs. Can you guess what they said when they charged me with cutting trees? It makes me laugh. Well, we already talked about when AMITIGRA took me to the district attorney and the judge.

The judge there said “Damage to State property.” Listen up, damage to State property. And I started laughing and the judge said to me “Why are you laughing?” “Because I thought the property belonged to my father-in-law, do you mean to tell me that it is leased, that the deed isn’t valid?” “No, it is still his.” “No, and I am going to explain why. Because if you gave me that tie you are wearing then it must be yours because you cannot give me something that is not yours. It is borrowed. And that is what this man has then, a lease that he is looking after for the State.” That is the truth. If you cannot do whatever you want with something then it is not yours. It is that simple. The State makes the laws and the same state is expropriating them. Only here I have seen this. Or I don’t know if it is like this in other countries because I have never left here. (#212)

They go and take them by force, “Let them take us away” they say. And so they just go and get one, they cut down the trees and they take them to the house to saw up. We do too, when we need a tree we cut it down by force. We say it is practically stolen although it is ours. For example a tree that fell on the power line we cut down so that it didn’t break the wires, it had already fallen and if we hadn’t cut it down we would have been without electricity. And so the oldest went to cut it down to see if it was true that they would put them in jail but nothing has happened. It’s that it has to be done by force. (#109)

People also felt they were restricted from entering the core area of the park, even on private property, and that this was unfair. This appears to be a result of both demarcation of the core zone as being viewed as an access restriction and areas near water reservoirs in the park, managed by the National Autonomous Service for Aqueducts and Sewers (SANAA), which are often guarded and off limits to the public. The idea of compensation of these areas was predominant in Cofradía and expressed as a potential solution to the issues surrounding land rights and access.

Changes in moving freely, yes I have noticed that because before we used to move freely and here AMITIGRA has come to possess and put up posts or bars and so now one can’t enter the forest freely. (#207)

They have invaded all the land, so that now it is not us that have control but other institutions and now we don’t have the rights to it. And all of that is what happens, and with all of this we have put in a request to look for a way to see if the government will pay us because now they don’t let us even go onto what is ours. Rather AMITIGRA is there, SANAA is there and all that. And they want to empower themselves but they don’t want to pay. (#208)

But now it is prohibited to enter there. The road is there but since the water for SANAA comes from there, all the pipes going to Tegucigalpa, or you could say that Tegucigalpa maintains itself from this mountain. In one part we are thankful, it is certain that what the government is doing is good, but in another part we don't have permission anymore to go look for a tree to build our house. I don't know what we are going to do in the future; it is going to fall on top of us. (#209)

The situation of private lands in protected areas creates confusion over who owns the land and the resources and who has right to use them. Pfeffer et al. (2001) found that park resident felt that their land had been sold in creation of the park and ownership of park lands was unclear. Similarly Schelhas and Pfeffer (2005) found that even when people accepted conservation in the park, they often objected to interference of land or resource use on their own property. In LTNP similar confusion exists on lands that are grown over and restricted from cultivation and on natural resources on private lands. Although compensation or expropriation is an option, clarification of regulations and property rights is also needed to mitigate this issue.

7.3.3 Land use and Livelihood

Although land use and livelihood issues are largely related to land rights, issues surrounding land use and livelihood were more focussed on actually making a living from the land rather than issues about ownership rights to do what one likes with the land. Particularly in developing countries, land is often a limited which affects the ability of local people adjacent to protected areas to earn a living (Alkan et al. 2009). These issues were mentioned by 33% (n=18) of people interviewed in LTNP. People in all five communities mentioned land use and livelihood as an issue for them including 45% of respondents from El Rosario, 42% from Cofradía, 33% from Juncales, 30% from El Carbón, and 15% from Jutiapa. Issues related to land use and livelihood mainly stem from people feeling limited in meeting their subsistence

needs from their land and restrictions on expanding the area of cultivated plots. Most people expressed that they understood that forest was important but that people's livelihoods also needed to be a priority.

It is okay that the forest must be protected I am the first to believe this, but that they leave me somewhere to work, somewhere to get my food from. But frankly they want us to live like parasites. (#212)

I have here documents that talk about how we have been with the real integral people of AMITIGRA, where it has been seen that we want to reforest the mountain but also that they let us work. The truth of it is that one lives from this, one doesn't have income like what you were saying, and how good it would be if I could reforest an area where I work but how would we live? This is the problem. (#306)

People also stated feeling restricted that they could not expand their agricultural plots beyond what they already had cultivated. This was sometimes expressed as the land was more productive as agricultural land than forest.

Well the people that are already inside the core zone, and close to the core zone, yes. In the sense that, like I was saying, people not just what they have but if they get some money and want to expand more, make the farm plot bigger even if they have the land it is obsolete. It is just left obsolete. (#505)

Look here the majority of the people from here up [the mountain] can't plant because here there are no lands to plant and those that have land sometimes don't lend it. Because, look at all that land there, it is wasting away. (#108)

Look I have been here 40 years, on the mountain, and I have seen it like this since I came and it is the same. AMITIGRA hasn't made it better. The mountain was made by my Father and he said this is going to be here, this is going to be a mountain. These lands that are here, from the tall trees and above was forest and from the tall trees down were working lands. In this system yes it has changed. Because, as we say, they have let the trees grow and meanwhile what they want is to see it pure forest. And so how are we going to live? From the trees? From the leaves of the trees? We cannot plant, and if not we have nothing. (#503)

Other people talked about the lack of options for employment in the community and that given this lack of options and restrictions on agricultural expansion the young people had to leave the community to earn a living.

And so in the area of forests, we cannot plant because even to cut a dry tree we need to ask permission, you understand. We are totally restricted. And finally, like I said, because of this the majority of the young people have gone to the city. Because here crops, planting, you can't anymore. (#404)

Because in the long run this is a community that has already developed, there is no work here for people. For example here all the lands are almost forest now, not crops anymore. The people that have their lands have them clear. You have to be careful because if you let them grow, let the vegetation grow you cannot work them anymore because then they are in the protected area. And yes, for example, work for people, that people could have something to develop more. (#508)

The idea of ensuring that plots of land are kept clear was mentioned by a few residents and is very relevant to both conservation and livelihood. In traditional local systems of agriculture areas of land are left fallow for a number of years to renew soil fertility and then cut or burnt to initiate a new planting cycle. Legally people are allowed to clear fallow lands, but not primary or secondary forest; however, the distinction between regenerating fallow lands and secondary forest is unclear and contentious. Thus, people expressed that rather than leave land fallow they ensured it was clear to avoid the potential classification of the land as forest. This action would compromise both livelihood and conservation as land would increasingly become less productive from more intense use and ecological benefits of fallow systems (e.g. soil protection, wildlife habitat) would be reduced.

The issue of land use is contentious because even when people have positive attitudes towards protected areas they often feel that they cannot change their present land or resource use patterns because of lack of proper alternatives (Badola 1998). Durand (2010) found that

residents of Sierra de Huautla Biosphere Reserve in Mexico felt there was a contradiction between agricultural practices and conservation and found it difficult to imagine adaption or transformation of practices which would provide both human necessities and ecological conservation. This was evident in LTNP where people expressed frustration that they were expected to conserve areas through reforestation and at the same time have sufficient land to work. The focus of AMITIGRA on protection and reforestation and dominant conservation discourse which focusses on separation of human use and natural areas likely contributes to this view that human land use and conservation are not compatible. Durand and Lazos (2008) also indicate that conservation was often rejected because its benefits were not immediately apparent and people were hesitant to invest time and work on something that may not have concrete gains. Compensation for loss of livelihood and programs that focus on integration of activities and alternatives to traditional land uses are needed to alleviate this issue.

7.3.4 Lack of Direct Benefits to the Community

Lack of suitable compensation often exacerbates issues related to restrictions on land or resources and can result in greater dissatisfaction with conservation and protected areas (Liu et al. 2010). Unmet expectations of employment opportunities and economic returns from protected areas are common areas of contention for residents of protected areas (Allendorf 2007, Tessema et al. 2010, Sarker and Roskaft 2011). People also often feel that they should be rewarded for conservation of their local area (Durand and Lazos 2008). Comments related to the lack of direct benefits were mostly in answer to questions related to benefits of the park, benefits of AMITIGRA and who benefitted from the park. In total 56% of people (n=31) stated that they felt that the community should receive more direct benefits from the park or that economic

revenue from the park should be shared with the communities. People in all five communities expressed this concern including 85% of respondents from Jutiapa, 83% from Cofradía, 55% from El Rosario, 33% from Juncales and 10% from El Carbón. Many people, particularly in Cofradía, simply stated that they received no benefits and that they should receive more benefits. However, people in other communities, particularly Jutiapa and El Rosario (where most tourism occurs) linked the lack of benefits to money from tourism and project grants. These two communities were also most likely to identify AMITIGRA as a beneficiary of the park, thus it is likely that the expectation of benefits and perceived lack of benefits is highly related to the view of other people benefitting.

It is unfair because I say that there has to be benefits for the community too. Because they profit from this place, from the tourists that enter, all the money that comes in goes to the office and there is stays because AMITIGRA doesn't have many workers here, there are maybe five. (#506)

AMITIGRA doesn't do anything. Maybe the workers get along with them, those from here within the area, but all of the community, no. They have a bad opinion of AMITIGRA, they take advantage of the economic benefit of the park but they don't give back. (#510)

What they have to do, more than anything, is support the community. Give some benefits to the community from all of what they receive; because aids have come to AMITIGRA, they have consumed them themselves, the big guys and the employees from there. But the community as such, no. Maybe very recently they have given a bit, I am not saying that they have not collaborated, they have collaborated, but like I said from maybe three or four grants, with maybe a quarter of one. (#402)

Well they do because the truth is that one does not benefit, not even the community, rather only them. They have their organisation, AMITIGRA, but the truth is I don't know what they do. Look even to fix the road, they don't let the community do anything because- or it harms us a lot because lately the bus can only make it to a certain point. One has to walk here with their bags or if they are bringing food or whatever they are carrying, one has to put it on their back and walk. And they don't permit the fixing of the road up to here, even up to La Tigra, to the real park. They say that the animals will move away, that it damages I don't know what in the mountain and all that. And they

don't allow it. And when tourists come all the money stays there for the Foundation. It doesn't serve the community. (#408)

Other people related the lack of benefits to few employment opportunities for people in the community and the idea that the people in the community are the ones really caring for the forest and should receive some economic benefit from that.

Well people say that they should give work to those from here. Having people work from other places, that is what people from this area are for, so that they can give work to people from here. (#511)

Because look if we are here and we protect our area and nobodies pays us for this, only with what we are taking from here, I don't see that as fair. (#309)

Yes because, look, these resources, someone is receiving big salaries to care for these resources. It is worse that they are from other places because it should be the local people who benefit in the first place. (#412)

Several people also mentioned a proposal or agreement that was supposed to return 10% of the tourist revenue back to the communities. It is unclear whether this agreement was a proposal from the communities or promised during the creation of the park; however, people feel that they are being cheated out of this revenue.

Because as we were talking about, AMITIGRA, well all the benefits that are received, I can tell you that they don't even return 5% to the community. Because before we had a proposal that from the people that entered the park that 10% would be returned to the community. We arrived at, well not really arrived at, a conclusion, an agreement really because we know that the community has the right. Like I said, when a Honduran visitor or a foreigner comes they leave behind a benefit. (#410)

Workshops, they call them but I don't know if you know the phrase that we use in Honduras, 'covering the eyes of the male,' so that they say AMITIGRA is in Valle de Angeles and they are putting on a workshop there in the centre. But like I said it is only so that they can say AMITIGRA is conducting projects. And they have had projects various times but with money that comes from other places. Because, look, they were going to pay 10% of the entrance fees from La Tigra. But look, money enters there, even dollars, tourists enter and if it is someone from here with little money they charge them

*20 lempiras but ah if they see that someone has a little more, then they say it is 100.
(#404)*

Results related to lack of direct benefit to the community are consistent with literature which identifies lack of employment and economic revenue from the park as issues causing dissatisfaction with protected areas. Greater transparency and implementation of initiatives which provide direct economic benefits to the communities such as compensation or support for economic development could mitigate this issue and lead to perceptions of more benefits from the park.

7.3.5 Lack of Effective Communication and Participation

People's relationships to protected areas are not just affected by the protected area itself but also by the relationship with management of the area (Alexander 2007, Tessema et al. 2010, Karanth and Nepal 2012). An important factor in relationship building is effective communication and participation of residents.

Lack of effective communication and participation was directly expressed as an issue by residents and results of poor communication were noted in other areas of the interview. The issue of effective communication or participation between residents and AMITIGRA was directly mentioned by 49% of people interviewed (n=27). This issue was directly mentioned by 69% of respondents from Jutiapa, 67% from Cofradía, 55% from El Rosario, 30% from El Carbón and 11% from Juncales. Those who directly mentioned lack of effective communication or participation talked about both the lack of knowledge of what AMITIGRA did and the lack of understanding of the community by AMITIGRA.

In reality they don't have a participation in all of the community. I know that there are people that work with them but I don't know anything about them because it's not like

they have a meeting with the community and say this is how it is, we are going to do this or that. No, nothing like that, or maybe internally they do with the people that work with them. (#203)

Like I said we would like them to come so that they know the problems of the community. But sometime they withdraw themselves. (#306)

Well, like I was saying at the beginning, I wish that there was more closeness, for example. Speaking directly about AMITIGRA, that AMITIGRA had a bit more awareness and that they were closer to the community and looked for ways to win over the community. AMITIGRA, some employees, have had a lot of problems with people in the community because, the same thing, they don't have the ethics to come to people and say "Look this you cannot do, this is bad, and it harms you and the community." And so maybe if they had a bit more, like I was saying, ethics I guess. (#402)

People expressed that they felt that AMITIGRA acted more as an authority than they worked towards building relationships with the community.

The truth, AMITIGRA's relationship with the town is not very good. They don't come and say "We are going to have a meeting and look we are going to this, this and this." They don't come and meet; they don't come looking for us or anything. They just create their laws and enforce them and that's it. (#207)

And so these things like that, these are the things that bother us. Look, the truth is what bothers people is that they want us to be submissive, that we say that everything is okay. How am I going to say that everything is okay if they are harming me? They named me president so that I can look out for the rights of people. If I don't do that I am not complying with that, it is that simple. (#212)

The community doesn't like it but since one is always dominated by bigger people, they are the ones with the control and one always has to yield to what they say. (#208)

Besides the issues of people feeling isolated from management activities or lacking in information, specific results of ineffective communication were observed through resident interviews. Three particular issues that I noted were residents' discussions of broken promises, community relocation and payment for environmental services. Twenty-five percent of

respondents mentioned broken promises and that they felt AMITIGRA could not be trusted because of this.

It is that they have offered us a lot and so one here almost doesn't believe in AMITIGRA. For example here they created a breach, the people here asked for a loan for a power line and when the time came people went to work but the money never arrived. (#103)

Rather one wants them to come to talk. Sometime they use the communities or they take signatures from the communities but later they don't come back to show anything. Two times now I have experienced this that they say "We are going to help the community" and the help never arrived. And so sometimes they have gotten mad as us because we have spoken the truth. (#306)

AMITIGRA entered here in 1994, I already had more or less memory at that time. I remember that AMITIGRA started deceiving the community, to say it like that, in the sense that it came and tried to absorb some people with a bit more knowledge and I remember a meeting, an assembly of the community, they said that AMITIGRA was going to enter to protect the park and they were going to give an average of ten percent to the community. At which time they involved some people from the community that were part of the agricultural cooperative and the town council. And as soon as they saw that these people were a stone in their shoe, they tried to isolate them, put them aside. Why? Because they didn't want them to exist there and demand what they had been promised. And to this moment, well they haven't given us the ten percent. (#402)

When they told us that international aids were coming that were for poverty reduction, they deceived us. They told us that they were going to give us I don't know how many million for that, that we should make a plan, a plan specifying what we were going to do. And so we made a plan that we were going to protect an area of the forest, we were going to make tree nurseries. They were going to give work to the people and plant trees in all the watersheds. And so they told us that we had to have a lawyer that would do the paperwork but it never arrived. They stole all the millions. That poverty reduction, a lie. (#505)

A community leader commented on the idea of broken promises, indicating that people often did not understand how the process of obtaining funding and project implementation worked.

The problem is that there have been so many things in meeting that they have made plans and the people believe that it is just writing it and then it happens. Although many times they have explained that this is just a document and that with time it could happen, it comes or it doesn't or if we are not here and others are. People think that if I make a

note for a grant, to build a house that the next month I am going to say “here are the materials.” And because of this some things have arisen, that they have offered things that are not completed, things like that. But there are those of us who understand things, those that go to the meetings, people like you have come looking for, the leaders. The leaders are those who are most called for meetings. (#107)

It is likely that there have been times when projects were promised and not completed and other times when that this was perceived to be the case through misunderstandings of the process. In both cases adequate explanation of the situation was not effectively communicated to residents and residents were not effectively included in project development or implementation.

Another issue of miscommunication was the rumours of relocation. As discussed previously, with the exception of Juncales which was moved from the core zone to the buffer zone when it was destroyed by Hurricane Mitch in 1998, no expropriation or relocation of residents has occurred in the park; however, 15% of residents mentioned at some point in the interview that AMITIGRA wanted to remove the people from the park.

And I want to be very clear on this because some 15 or 20 years ago they were going to remove us from Cofradía. Everything, the entire population. We were going to Bajo Aguan². Listen well, expropriate us completely and send us to Bajo Aguan, like “We are going to grab this group,” the battalion trucks were coming to take us, to practically expropriate us because they were going to make this a tourist area is what they had in mind. I have not forgotten about this. (#212)

From their part, what they want is that we leave here. (#503)

Also the only thing is that the laws have become very strict. Well this doesn't convenience us much in that part. They want to restrict us in all ways. If it was possible that we wouldn't even live here because this has been their objective, to remove us from this place. (#304)

² Bajo Aguan is an area on the north coast of Honduras where a large conflict between campesinos and industrial agriculture has occurred and many people were forcibly displaced from the land. Perhaps because of media coverage of this conflict, this area was often mentioned as the place people from La Tigra would be sent to.

There was a time when they also said that they were going to relocate the whole community. They were going to send us there, to Bajo Aguan. They were going to send all the people there because they were damaging everything. I don't know what they have there; one is not very involved in these things, but yes. (Interviewer: How did the community react to this?) Well like I said, if they tell us that we have to relocate we are not going to permit it because we have been here our whole lives, from our grandparents, great-grandparents and everything. It goes from generation to generation and one has lived here their whole life. And if we had to leave here and they sent us to another place where one has never visited nor knows how it is, that would feel ugly. And here everybody has their little plots of land. Everyone plants their crops and that is how we live. (#408)

Although there are no plans to relocate any communities and managers state that relocation is not an option, in key informant interviews all managers also expressed that people were the biggest problem and that ideally there would be no people living within the park. Allendorf (2007) found that fears of resettlement had a negative impact on people's attitudes towards protected areas. Human impact problems were mentioned by managers as a large threat to the conservation of resources in the park; however, expression of such sentiments in the communities related to wishes that there were no people in the park could lead to misinterpretation of intentions and damage relationship building.

Another issue raised by residents related to the results of poor communication was knowledge surrounding the new AMITIGRA initiative for payment of environmental services. This initiative focusses on AMITIGRA receiving payment for water taken out of the park by the state owned water corporation SANAA. The project would be implemented by an additional "conservation" fee paid by users of the water (including residents of the park) which would be directed into an Environmental Services Fund. The fund, managed by AMITIGRA, would be used to implement conservation and development programs in the park and potentially compensate land owners who implement conservation measures. Although this program has exciting potential to return benefits to the community, the intended message has not been

disseminated well and residents see this as intent to privatise the water, provide more economic benefits to AMITIGRA and raise costs to people living in the park.

Well the only benefit is the water. Well now the water and the oxygen. But now they are generating a law that they are putting into the congress that they want us to pay them for the water that comes out of the mountain. And the owners of this mountain are not the rich, they are the communities. Cofradía alone owns about 25%. And so now they want to say that Cofradía should pay the water and the water pays the State, and the State should give this money to them. I don't know what for but yes there is a law that they are basically creating. Like I said, not to create a plan for the medium and long term and to see results, rather for money, just money. (#201)

I believe that right now we don't see any damage but more in the future because I don't know but I have heard that they are going to charge us by area, I believe that this will affect us a lot. The moment will arrive when even the water is going to be privatised. (#205)

I found out about this article that they wanted the congress to approve because I was invited to a meeting in Jutiapa, since Jutiapa is more affected than we are because Jutiapa is in the core zone. And they started to explain about the articles that AMITIGRA has. And so they gave us a talk, quickly because in truth there were various topics that we had to touch on, and well from them we learned that AMITIGRA has this article that they are taking to congress to approve. Supposedly from what I understand, I don't know, I didn't really understand, but each subscriber, each inhabitant will have to pay 30 or 35 lempiras more in each community. Or you could say in this case, we would pay 30 lempiras per month more for water and so this would raise the 35 lempiras per subscriber to be 75 lempiras. And the truth is that it doesn't bring any benefit because they have not explained why they are going to increase this, they haven't explained anything and I don't see any benefit. It would be better if AMITIGRA came here, had a conversation, and explained better so that we don't take it the wrong way. (Interviewer: Who gave you this talk?) Those from Jutiapa who have the most contact with AMITIGRA since they are in the core zone. They explained to us about the 35 lempiras. They just told us "Look, this is happening and AMITIGRA wants to do this." Or you could say that they have prohibited them, they have prohibited planting and constructing, I suppose for the chemicals, the flora and fauna, and so they seem to be more affected in this. And so they called us so that we could unite as communities that are on the perimeter of the national area, the area of La Tigra, that we would unite to fight for our rights. Because we do not benefit from them. (#207)

These specific issues and the number of people who directly expressed that they felt that there was a lack of effective communication and participation suggest that this issue has

hampered relationship building between AMITIGRA and the communities and has led to negative views towards the protected area. Tessema et al. (2010) found that local people did not trust local conservation NGOs because they promised community benefits but seldom delivered. Likewise the lack of effective communication and examples of the results of this in LTNP show how this issue has led to mistrust of AMITIGRA. In order to create opportunities to solve the other problems and issues perceived by residents a positive perception of the administration is necessary (Oltremari and Jackson 2006). More regular outreach and formal methods for involvement of the community in management activities could lead to reduction of negative perceptions as a result of misunderstanding of management activities and objectives (Ferreira and Freire 2009).

Many people mentioned the poor participation and communication as a factor in poor relations between residents and AMITIGRA. To better understand this issue I asked people if they thought that the residents of the communities should participate more in park management and if so how. Ninety-five percent of residents interviewed said that they should participate more. Although it is likely that some people responded in a manner they thought they were expected, residents listed eight ways in which they thought they could or should participate more in the management of the park (Table 7-1).

Table 7-1 How Can Residents Participate in Park Management

Participation Method	Number of Respondents¹	Percent of Respondents
Direct Involvement	25	45%
Projects	17	31%
Education	13	24%
Care for the forest	10	18%
Cooperate with authorities	7	13%
Direct or Indirect Employment	6	11%
Compensation	3	5%
Not necessary	3	5%
¹ n=55		

Of the three residents who thought that they did not need to participate more, one said that it was getting involved was not possible or encouraged by AMITIGRA, one thought that it was not necessary as the community was already very environmentally conscious and the other that the community had no interest in being involved but just wanted to earn their living.

People mentioned possible solutions to this communication and participation issues such as direct involvement in management, projects and education and indicated that better communication and participation would lead to more support for AMITIGRA and the park. Forty-five percent of residents interviewed (n=25) thought there should be more direct participation of the communities in park management. Ideas for direct involvement took several forms including delegating and enforcing more responsibility in the communities, training of a community group to represent the communities in management decisions, use of liaisons between the community and AMITIGRA, employment of community members on the board or management staff, community enforcement of regulations, work with established groups such as the town council, the water committee or Common Lands Association and full community management of the area.

Well the groups that we are forming to be more knowledgeable, for me, in my way of thinking, AMITIGRA should train a group from the town to say this is what one can do and this is what we don't have. For me what would be best is if they communicated with us or formed groups to say this is what they are going to do or this is a benefit and this is not a benefit. (#202)

Look, from the point of view of the community, we think, or at least I think that there should be a person from the community within the institution of AMITIGRA. There should be a person from the community inside the organisation. Why? Well, truthfully so that there is a person that realises how AMITIGRA is functioning, what the benefits are that the community obtains or what the rights of the communities are. I think that it would be logical to have one or two people inside the institution. (#410)

Others that are not from the community come and receive generous salaries. They could have employees such as directors, presidents etc., all the board, all the members of the board of directors could be from the community. Because, I repeat, that this is the question, that here all of this is done in a disorganised form. Because if the director of AMITIGRA comes, being from the city, he doesn't know the problems here and he is not interested. He just waits there for the reports. But he doesn't know if those reports are altered or if they are real, if what they are living is what is being said. (#412)

Because I have seen that the most power that there are in the communities are the Water Committees. And so through this, I think that it would be a bit easier for them to promote some activities, right, some training in order to improve the relations between AMITIGRA and the communities. And that the benefits would be for the protection of the area. (#401)

Well, returning to the same, that is what I was saying that if there was a directive AMITIGRA wouldn't be managing rather it would be the town council. Because although we have good documents and people what happens is that there is not good administration. If, for example, there was a good [local] administration there would not be an institution meddling here. (#503)

The idea of having community members within AMITIGRA is interesting given that park guards are largely from the community where they are based. Similar to the views expressed on environmental education, this indicates that guards are not viewed as liaisons between the community and AMITIGRA.

Thirty-one percent of residents interviewed (n=17) indicated that the community could be more involved through participation in projects. Projects mentioned were largely projects that AMITIGRA oversees including tree planting, tree nursery, firefighting and prevention, road improvement and sustainable agriculture. People also mentioned the idea of implementing agroforestry managed by the community. Although many people mentioned specific projects that they thought should be used to encourage more community participation a few mentioned that projects should be developed with the community in order to benefit both the park and the community.

Well in the first place the community has to unite. And some of the projects that are managed at the level of the institution, it should be the community that begins them so that the community develops. So that in some way people see that some projects that AMITIGRA supposedly manages, not 100%, but that the communities manage them. And so I think that the community would feel responsible, as much to protect as to develop some activities within the community. And they would also realise how to the projects are managed. And so I think that in that way it would be a bit better. (#401)

Always things that have a direct benefit for both sides. I imagine that, for example, the maintenance of the road or access in general or maintenance of structures one could say. This I believe that AMITIGRA as much as the community is interested in this. It is strange to me that AMITIGRA doesn't give any training to the small farmers here that they shouldn't use chemicals here, nothing of what the danger is to the water and here nobody knows that. They do not spray much, once in a while and only a few buy mineral fertilisers but maybe they are missing an orientation about organic crops. Nobody knows anything about that here. (#509)

Look one day not too far in the future all the communities are going to empower themselves and they are going to stop the Foundation from entering, as a protest. Because the projects that they get, they use the communities, but we don't see these projects. This should be expanded. I say that with all the projects that AMITIGRA develops they should be developed with those from the communities. That is what they need to do here. Because we need to build three houses here but we have problems because of the wood and the laminate and some things. And if we had this, in the future we are not going to say that we are enemies of AMITIGRA, enemies of the Foundation because we see that the project was developed for what it was. And so I feel convinced that where there are protected areas that they take into account the communities. And I am not saying this only here. (#412)

Twenty-four percent of respondents (n=13) mentioned education as an avenue of participation. People felt that they would be able to better care for the forest if they had a better understanding of how to do it.

It shouldn't be that we involve ourselves it should be that they engage us. That would be the word. Let us get involved directly in the park, but in reality AMITIGRA doesn't engage us. And so I believe that it is bad. Bring more direct benefits, do more promotion for the villages, look for training with INFOP so that they can do this or do that. If you look at everything you have seen in the community nobody dedicates themselves to anything. If you go to other areas or protected areas they say "Ah no look we have this." They offer and here nobody offers anything because AMITIGRA doesn't involve the community in anything. (#510)

What I was saying before. For me it is interesting and necessary that they involve us in education about the protection of the park. So that it facilitates the company that is in charge of protection and also so that the people internally understand that the protection of the park is a benefit, principally for the communities that are around, right, and secondly for the people that are in the city. And so I think that the participation of the people that reside around the park is very necessary. I think that they are the people that it is most important to involve in this because they are the people that have contact with the area. (#401)

For me there is a lack of motivation. Talk more with people, meet more, meet with them and motivate them. Because sometimes you know the campesino goes out early in the morning and returns at two or three in the afternoon to do wage work and if not they come back tired, to sleep. And the next day, the same, right? And sometimes there isn't motivation for them and so they are unconcerned. But one time there was motivation. It was beautiful, there weren't even any fires. And so for me, they need more closeness with people that live in the community. To motivate them, because sometimes one doesn't listen, ignores things, and doesn't understand how to care, to protect the area. (#102)

People also responded with the somewhat vague "by caring for the forest" without specifying what this would entail. These answers were similar to responses to what people would like to do to conserve the forest and resources and may indicate a lack of in-depth knowledge about these concepts. Other means of participation mentioned were by cooperating with the authorities and obeying regulations, through direct or indirect employment in the park and by receiving compensation.

The relatively high number of people who mentioned direct involvement, projects and education indicates an opportunity for AMITIGRA to meaningfully involve the community in park management and activities.

7.4 Discussion

Even when people recognise and receive benefits from the protected area, concerns raised during interviews affect residents' relationship with the park and park management. Although the majority of people expressed they did not have problems with the park or management because they were not being directly harmed by enforcement of regulations on illegal activities, indirect issues associated with land and livelihood restrictions and reciprocal communication indicate that people associated feelings of discontent more with these issues than the park itself.

Issues raised by residents related to living in the core or buffer zones of LTNP are complex. Although each issue is discussed separately for the purpose of clarity, issues related to use of wood, land use, land rights, direct benefits and participation are largely interconnected. For example, people talked about land right and the effects on land use and livelihood as well as the lack of direct benefits or compensation for unavailable land. The idea that such issues are so interconnected creates problems for potential solutions but also indicates that mitigation of one issue may affect concerns related to other issues and decrease negative perceptions. Meaningful community participation has potential to create locally appropriate management and mitigate issues.

Chapter Eight: Discussion

8.1 Introduction

In this chapter I discuss the results of the research in the context of local management and position the work into the larger theoretical understanding of people and parks. Describing both specific local outcomes as well as theoretical outcomes allows for context specific information to be applied to the larger understanding of protected areas management and allows comparisons across different areas around the world. I have organised this chapter to answer the research questions, looking at residents' relationship to La Tigra National Park (LTNP), key issues expressed by residents about this relationship and recommendations of how these key issues can be addressed using precedent studies and ideas from resident and manager interviews.

8.2 Residents Relationship to LTNP

LTNP provides an interesting example of the parks and people dilemma. The unusual situation of a co-management agreement for management of a national park between an NGO and government creates both opportunities and difficulties for residents in the park. Conservation requires protection of natural resources; however, local people rely on these resources for livelihood needs. To examine people's relationship with protected areas Allendorf (2010) calls for a move away from study of individual components of people's relationship with parks such as the ecological, economic or social components. She suggests that such relationships should be studied as integrated, complex systems based on both physical relationships with natural resources, perceptions of protected areas and conservation and economic or livelihood concerns. This thesis endeavours to create a holistic picture of the relationship of residents of La Tigra National Park to the park and park management, accounting for residents' physical relationship

with land and natural resources, understanding of conservation and the park, perceived benefits and costs associated with living in a protected area and their relationship with management.

8.2.1 Education and Awareness of Formal Conservation

Although a formal evaluation of AMITIGRA's education program is outside the scope of this work, information on local environmental knowledge gives insight into current park education and how it affects resident's relationship with LTNP, their perceptions of conservation and some of the key issues related to conservation and livelihoods in the park. Education and awareness of conservation concepts and park management can increase support for the park's goals and activities among local residents (Barton 2001). However, environmental education does not necessarily translate into more positive attitudes towards protected areas or conservation action (Pfeffer et al. 2006). In the National Institute for Forest Conservation (ICF) formal evaluation of LTNP factors contributing to the "Satisfactory" management rating included: communication and disclosure of management activities, the existence of an environmental education plan and media coverage aimed at educating the public on the importance of the park. However, I found that formal conservation knowledge, especially related to LTNP, was relatively low among residents. Although there was a general understanding of conservation concepts and some park regulations and an expression of local conservation values, residents' specific knowledge related to La Tigra National Park was less comprehensive. Residents had a high awareness of the existence of the park but knowledge of zone boundaries, management structure and objectives was not as clear. This paucity of knowledge is consistent with the literature indicating that people in or near protected areas often have a high awareness of the existence of the areas but little knowledge about details of their goals and management (Olomí-

Solà et al. 2012). Knowledge surrounding regulations was mixed. All residents interviewed expressed that they understood that cutting of live trees was illegal and held consequences such as an informal reprimands, fines or jail. However, the perception that these activities extended to collecting dead and dry fallen wood, which is legal, was also common, particularly in Cofradía, causing people to feel that conservation of the area restricted even their most basic needs and required them to perform what they believed were illegal activities to meet these needs. This belief of a lack of accommodation for local needs created resentment towards management and negative perceptions and attitudes of the park.

What information that was known was generally related to protection for water. The creation of LTNP was largely attributed to water resources, which is consistent with legislation and the main focus of the Fundación Amigos de La Tigra (AMITIGRA); however, other reasons for creating the park such as wildlife conservation or environmental education were not widely known or expressed. Water conservation values have been strongly communicated by AMITIGRA to the communities through education programs and residents gave many examples of how conservation of water through forest conservation was important.

Efforts by AMITIGRA in environmental education and conservation programs have been important in relationship building with the communities. Particular programs that have been well received in the communities are those that have aimed to improve quality of life such as the water project and eco-stoves. However, it appears that residents do not see a two-way transfer of environment knowledge. Residents felt communication was lacking with the organisation and that community concerns were not heard or taken into account in management. Likewise, programs were not always associated with AMITIGRA or attributed as a source of environmental knowledge. The lack of knowledge of residents of LTNP, combined with

residents' view that knowledge was gained by life experience and the lack of connection of programs with AMITIGRA and their conservation objectives, indicates that management activities and programs are not very effective in raising awareness or creating a forum for discussions about management of the park. The lack of this park specific knowledge and the ill-defined roles of ICF and AMITIGRA often led to confusion of regulations and management structures which may delegitimise activities of AMITIGRA and create problems between communities and management.

Further education programs should be developed in LTNP to better communicate formal park knowledge as well as incorporate local conservation knowledge and values into management actions. Education can be empowering and meaningful for local people if effectively employed; however, "top down" styles of education can create power imbalances towards the knowledge and perceptions of experts and may not lead to internalisation of knowledge or support for conservation concepts. On the other hand participatory education styles that include interactions between educators and learners tend to value local knowledge and values (Barton 2001). In this way both formal "expert" knowledge (e.g. land use, regulations and scientific ecological information) and informal local knowledge (e.g. local context and knowledge, environmental values and resource use) is shared, producing more common understanding on both sides. This common understanding may create more motivation to action (Barton 2001). In the interviews, residents expressed interest in more participatory education when talking about desired resource conservation actions and how they could participate more in park management. Some residents even indicated the desire to share their conservation knowledge with other community members and to share local information and concerns with AMITIGRA. Understanding of perceptions and attitudes through this two-way education

process can be used to develop programs and management actions that are relevant to and supported by local people. To effectively use this information AMITIGRA should not view education as a one way process to instill values and knowledge on the local communities but continually work to involve people in the education process so that information and values are shared between groups. To effectively participate, community groups and members must also take initiative to organise and share information with AMITIGRA in both formal and informal situations. This style of education often uses facilitators, sometimes from the community, to encourage dialogue rather than a formal lecture (Barton 2001). Outcomes of this type of education process are more likely to create support for regulations that are appropriate to the local context and allow for local empowerment and responsibility for stewardship.

Development of education programs in LTNP that draw on identified key issues, areas of ineffective communication and established values and perceptions of benefits outlined in this thesis is a good starting point to connect education programs with local conservation and livelihood values; however, a continued engagement strategy must be developed to effectively include residents in education and park management. Barton (2001) suggests that in Cerro Azul Meambar National Park (CAMNP) the education process became more accepted in the communities when it shifted from lectures by park guards to more shared learning and that the effects of this style of education are likely longer lasting. Education in LTNP that includes local participation and values local knowledge and capacity building would likely be more effective than the current one-way education programs. As suggested in interviews, this could be through more direct involvement in park management activities, participatory education programs and community involvement in projects.

8.2.2 Local Perceptions of Forests and Conservation

Local conservation knowledge and values were communicated through residents' perceptions of conservation and the importance of the forest and park benefits. Economic and livelihood issues are often touted as an important factor in peoples' relationships with parks, but these relationships also depend largely on the environmental values of local people (Schelhas and Pfeffer 2009). People's relationships to protected areas are formed by their physical relationship, attitudes and perceptions of the protected area and the broader social, political and economic context (Allendorf 2010). Resident's attitudes can be described through positive and negative perceptions they have of the area and management. Perceptions and attitudes influence people's values and thoughts which are integral to understand peoples' relationship with protected areas (de Albuquerque and de Albuquerque 2005).

Because of conflicts between local people and conservation bodies, and resulting opposition to protected areas or aspects of protected area management, it is often assumed that people living in or near protected areas are ignorant of conservation issues and do not hold strong conservation values. Recent literature indicates that local people have locally constructed ecological values and support conservation activities and tend to oppose certain regulations or management practices that conflict with locally constructed values rather than the concept of conservation itself (Badola 1998, Pfeffer et al. 2001, Gareau 2007, Schelhas and Pfeffer 2009, Allendorf et al. 2012). Residents of LTNP expressed both conservation values such as the need for formal protection but also exhibit seemingly contrasting values related to tree cutting, property rights and livelihood needs. In some cases these conservation and livelihood values are mixed, indicating the complexity of values, attitudes and perceptions where people hold seemingly conflicting values that are modified to the local context. Community programs that

build on existing conservation values and address livelihood needs are likely to lead to better community engagement in conservation and support from communities.

8.2.2.1 Conservation Values

Results of this study indicate the residents of LTNP have generally positive perceptions of forests and conservation. Residents of LTNP expressed positive perceptions of conservation largely in response to direct questions related to awareness of environmental change, conservation concepts and the need for formal designation to protect the forest, the shared responsibility for forest protection and benefits of the forest and park. Many of these perceptions were expressed as “verbal-molecules” (Strauss 2005) reflecting global conservation values which may or may not be internalized and lead to action. These ideas were very similar to verbal-molecules identified by Schelhas and Pfeffer (2008) in CAMNP indicating that these phrases and ideas are common throughout the country; however, many people expressed these ideas by relating them to their local context and life experiences suggesting that they are accepted local values rather than just repeated phrases.

When speaking of changes in forest cover most people conveyed the idea of forest loss as a negative concept, portraying the general perception that forest is desirable on the landscape. Similar responses were articulated when people were asked what would happen if LTNP were no longer a protected area. Almost unanimously people said that without the protection the forest would be lost, which was conveyed as a negative outcome and would result in the water drying up and warming of the local climate. The consistency of these answers indicates these are common community values which are held despite other livelihood values related to land and resources. These ideas also reflect an understanding of the need for a protection of the park.

Despite some conflicts with other livelihood values and with the administration of the park, it was understood that the area needs to be protected by someone, either the community or an external institution, or else it would be destroyed

Ecosystem service benefits have been found to be predictors of positive perceptions towards conservation and protected areas (Vodouhe et al. 2010, Wyman and Stein 2010). This was apparent in perceptions of conservation in LTNP where the importance of the forest in providing benefits such as water, air and cool climate was commonly expressed. Literature on values defines two main categories instrumental and intrinsic values. Instrumental values assign value to something that meets a need or provides a service such as water, wood or even shade. Intrinsic values value something for its own existence and not for human utility. These values may include spiritual or nature appreciation values (Van Dyke 2008). Bonta (2005) indicates that in Honduras the connection between water and forests and concern over water quantity and quality have been valued by local people long before establishment of national parks. He also states that other forest benefits such as shade, plants and income are linked to old ejidos or common lands which predate formal conservation in the country. Gareau (2007) argues that local communities in Honduras hold existence and intrinsic values of the forest and not just utilitarian values related to resource use. Thus “verbal-molecules” related to water production and other ecological services may have given people a way to express these existing intrinsic and utilitarian forest values (Schelhas and Pfeffer 2008). The value of the forest to residents of LTNP was extended to expressions of community responsibility for protecting the forest, despite indicating that the main responsibility of AMITIGRA and ICF was to protect the park. Although some people commented that this responsibility should be shared between AMITIGRA and the community, it is also possible that residents were identifying forests in the core zone as the park

and forests in their community as outside the park and therefore not just the responsibility of AMITIGRA or ICF.

People also separated conservation and livelihood values. For example when talking about which zone of the park they lived in, it was common for people to note that they did not live in the park or that people could not live in the park since forest protection was incompatible with human use. People also talked about how livelihood needs have led to the decrease in forest in the area. This separation may also indicate an understanding and acceptance of the different zones of the park where the core zone is viewed with higher conservation value than the buffer zone.

Perceptions of forests and conservation expressed during interviews give insight into residents' conservation values. Although not all local conservation values are identical to global conservation values, it is evident that residents' of LTNP value the forest and conservation of resources.

8.2.2.2 Livelihood Values

Although people held conservation values related to the forest, they also expressed the importance and sometimes priority of livelihood activities. Where livelihood activities were not seen to be compatible with formal conservation and/or acceptable alternatives were not perceived to exist, residents expressed concern or opposition to certain management practices. Issues related to conservation and livelihood included the use of wood and cutting permissions, land use and livelihood constraints and loss of land rights.

Perhaps wishing to convey their most positive environmental beliefs or unwillingness to expose illegal activities, residents seemed disinclined to talk about problems or concerns in direct

answer to questions but did mention concerns in responding to questions related to other topics in the interview. Restrictions to livelihood activities have been identified as a major impediment to creation of positive perceptions of protected areas (Silori 2007).

Livelihood values related to tree cutting and use of wood were expressed throughout the interviews. The majority of residents felt that it was okay to cut trees under certain conditions. In general these conditions were consistent with objective and regulations of buffer zones such as cutting a tree for personal use to use in construction or fence posts. Residents also expressed livelihood values when talking about resources they use from the forest and the need for these resources. Appealing to the idea of necessity, people felt that compromising conservation values was justified. Although conservation regulations were accepted in most cases, with people indicating that they understood that unregulated cutting of live trees was illegal and usually sought permission to cut live trees for construction, they also expressed that that in cases of emergency or out of frustration with the process they did so illegally. Along with conservation and ecosystem service benefits, perceptions of extraction benefits or lack thereof can affect residents' attitudes towards protected areas (Allendorf et al. 2012). Although most people did not outright oppose regulations on tree cutting, many people felt that restrictions on cutting even dead trees were too stringent or they were concerned with the difficulty or cost associated with getting a permit to cut a tree. People often admitted that if they could not obtain a permit or did not have the time or resources they cut trees illegally and that this often led to hard feelings towards AMITIGRA.

In a similar study in Costa Rica, enforcement of park regulations by the national government created an adversarial relationship between residents and park managers where people threatened to damage the park and stage protests in response to strict enforcement tree

cutting laws (Schelhas and Pfeffer 2009). In contrast, in CAMNP Honduras, the involvement of community authorities such as the town council in facilitating or approving permits reduced much of the tension around the permitting process for cutting trees. This community-level involvement in this process reduced the level of conflict between local people and park authorities by using collaborative governance that created an important, legitimate venue where the tensions between forest protection and subsistence needs could be resolved (Schelhas and Pfeffer 2009). A similar approach in LTNP where park guards, town council or water committee members had authority to facilitate the permitting process would likely help mitigate issues surrounding tree cutting. Resource allocation decisions made with local input and participation increase the feeling of “ownership” of rules for resource access and use (Ferroukhi 2003).

Private land rights were another value that may be seen to compromise traditional ideas of conservation. In some cases land rights were thought to supersede conservation values. Land rights and access issues were largely related to ownership, including land that has grown over and could no longer be worked, confusion and resentment related to ownership of resources on private property and lack of access to certain areas of the park. Although no land has been officially seized and a cadastre of private land in the buffer zone has not been completed, residents felt that their land rights have been compromised. People with forested or treed plots of land feel that this land has effectively been taken. Most people have all their land under cultivation and therefore this issue was most prevalent in Cofradía and Jutiapa where forest is still retained on lands held communally or by agricultural cooperatives. Residents also felt their ownership rights were compromised because they could not cut trees or use resources from private property even from small garden plots. People felt that this compromised their use of personal resources and created disincentive for growing trees for later personal use. Schelhas and

Pfeffer (2005) also found that even when people accepted conservation in the park, they often objected to interference in land or resource use on their own property.

People prioritised their subsistence livelihoods over forest conservation in some cases. People felt that opportunities to meet subsistence needs were limited from land use regulations and restrictions on expanding the area of cultivated plots. This was sometimes expressed as the land was more productive as agricultural land than forest. This was evident in LTNP where people expressed frustration that they were expected to conserve areas through reforestation and at the same time have sufficient land to work. Most people expressed that they understood that forest was important but that people's livelihoods also needed to be a priority. People also stated feeling restricted that they could not expand their agricultural plots beyond what they already had cultivated.

The idea of ensuring that plots of land are kept clear was mentioned by a few residents and is very relevant to both conservation and livelihood. In traditional local systems of agriculture, areas of land are left fallow for a number of years to renew soil fertility and then cut or burnt to initiate a new planting cycle. Legally people are allowed to clear fallow lands, but not primary or secondary forest; however, the distinction between regenerating fallow lands and secondary forest is unclear and contentious. Thus, people expressed that rather than leave land fallow they ensured it was clear to avoid the potential classification of the land as forest. This action would compromise both livelihood and conservation as land would increasingly become less productive from more intense use and ecological benefits of fallow systems (e.g. soil protection, wildlife habitat) would be reduced. The focus of AMITIGRA on protection and reforestation and dominant conservation discourse which focusses on separation of human use

and natural areas likely contributes to this view that human land use and conservation are not compatible.

Economic livelihood values were also talked about largely in relation to the lack of benefits from the park. Although residents felt that the park provided conservation and ecosystem services benefits, they felt that personal or community economic gains should be provided as a result of formal conservation. The idea that residents had no other choice but to use resources from the park because of their economic situation was commonly expressed. People also indicated that they felt they should be compensated for taking care of the forest or for restrictions to property rights or livelihood activities. A proposal or agreement that was supposed to return 10% of the tourist revenue back to the communities was often mentioned. Although the origins of this agreement or perception of an agreement were unclear, it was evident that people felt that this was something that was owed to the communities as payment for conservation of the area. Compensation agreements or programs between AMITIGRA and the communities may help resolve this issue. Compensation is discussed further in section 8.2.3.

8.2.2.3 Mediating Values

People's relationship to the park is complex as they try to mix both livelihood and conservation values and place priorities on one or the other depending on the context. In order to combine seemingly opposing set of values, residents adjusted conservation concepts to meet their local livelihood needs and modified livelihood practises to fit with conservation regulations or objectives. How people combine such perceptions and values presents a more holistic view of their relationship with forests and the park than examining views and values separately (Bonta 2005, Pfeffer et al. 2006). Pfeffer et al. (2001) argue that local expressions of common

environmental concerns emerge from interactions between local and organisational forces and that these interactions define context specific terms of acceptable resource use. In LTNP the combination of common concerns and local context created expressions of mediating values which were often mentioned in various parts of the interview rather than in direct response to questions. People mediated between conservation and livelihood values in several ways: through views of forest degradation as occurring from outside forces rather than personal or community resource use, though placing constraints or mitigations on various livelihood activities to be more compatible with conservation and by modifying ideas of conservation to include livelihood activities. Similar mitigating values were evident in residents of CAMNP where local people accepted forest conservation for watershed protection, tourism, and other benefits only when their livelihood requirements were also met (Schelhas and Pfeffer 2008, Schelhas and Pfeffer 2010).

Although some residents showed awareness of forest degradation or loss due to local land and resource use such as agricultural expansion or resource extraction, many people attributed deforestation or potential deforestation to the activities of outsiders or people in other communities. Other people noted that they did not think that small scale personal use of resources threatened conservation. It was also common for residents to express that the people in their community were aware that the forest was important and expressed strong sentiments of community responsibility for caring for or protecting the forest; however, they had trouble identifying personal actions to conserve resources and in most cases relied on AMITIGRA for enforcement of conservation regulations. These conflicting statements of valuing the forest but few concrete examples of how they express this value may reflect “lip-service” motivation that

people hold to be true but are not necessarily internalised enough to lead to action (Strauss 2005).

By not recognising personal responsibility for deforestation through livelihood activities people can hold both values without internal conflict. This lack of action may be due to the fact that some conservation regulations do not fit with local norms or that residents do not have formal responsibility or authority for stewardship of the area. When talking about desired conservation actions people expressed that they would like community tree nurseries and to replant trees in order to decrease pressures on the forest. Such local control and direct access to natural resources may lead to more conservation actions. Local nurseries and tree planting programs could be implemented to provide direct involvement in conservation activities and allow for local control of tree planting on private property or in areas that could be planted for future subsistence use.

Residents also mediated conservation and livelihood values by modifying land and resource activities to be more compatible with park regulations and formal conservation objectives. This was most evident in local norms related to tree cutting. Residents expressed that cutting trees for personal use was acceptable as long as it was not done in excess, for no reason or without the proper knowledge of which trees to take (usually related to trees at “water sources” or near streams). Cutting trees was also mitigated by the idea that one had to replant more than had been used. Although in some cases replanting was conducted by residents, often through AMITIGRA led programs, it was uncommon for people to say that they themselves replanted seedling but rather that it should be an available option through establishment of tree nurseries. Modification of how people used resources and where they collected them were also evidence of the changing of local activities to accommodate conservation regulations such as

collecting only fallen dead wood for firewood, only collecting wood or cutting trees from private property or the buffer zone, and acquiring the proper permission and permits to cut live trees. Although all of these activities are regulated by law and were sometimes spoken of as restrictions or inconveniences, people also often expressed these actions as something that was right to do rather than what was required or enforced.

People also modified formal conservation concepts to local context in order to continue established livelihood activities. In talking about when it was okay to cut trees, people indicated the belief that trees had a certain life cycle and when they were too old they were no longer useful to the forest and or that it was best to cut them before they died as utility value was why trees existed and they were not useful if they were already dead. The idea that dead trees were of no use was also expressed though people's frustration of why they could not use dead standing trees and that these trees were going to waste. Modification of conservation values was also evident in ideas that fruit trees and coffee shade trees were the equivalent of forest and therefore should be considered as reforestation.

Residents of LTNP expressed local values related to conservation and livelihood through their perceptions of forest, conservation and the park. In some cases these conservation values were consistent with formal conservation values and regulations such as the importance of the forest and the need for protection. In other cases residents modified either conservation concepts or livelihood activities to fit with local norms. In cases where residents did not see a way to incorporate conservation values and livelihood values dissatisfaction and frustration were often expressed, including issues of tree cutting permitting and use of wood, land rights and access, land use and lack of direct benefits.

Creation of a community tree nursery and planting program that allows for planting on private property and future use of trees could aid in resolving issues related to resource use and tree cutting while incorporating local values of personal use of trees on private property and reforestation. Agroforestry programs that promote planting and use of mixed or native tree cover can maintain or increase forest cover in multi-use landscapes. The forests in multi-use areas, such as private land in the buffer zone are then managed for conservation, while providing a source of livelihood for the local people (Rebecca et al. 2006, Dewi et al. 2013). Increasing local participation in resource management that links to meeting basic needs and serving subsistence purposes creates benefits to the community (Maryudi et al. 2012). Participation in park management and activities is described in section 8.2.3.

8.2.3 Relationship to the Park and Park Management

People's relationships with protected areas do not just include the direct relationship with the protected area itself but also the management bodies that facilitate or impact residents' interaction with the area (Allendorf 2010). In some cases, people's attitudes toward park management can be more negative than toward the protected area itself, indicating that it is not necessarily the relationship with and awareness of the protected area that need improving but relationship with management (Allendorf et al. 2006). Management issues raised by residents were largely related to lack of economic benefits, inefficient communication and local participation in management activities. These issues were similar to causes of negative attitudes towards protected areas in the literature (Fiallo and Jacobson 1995, Alexander 2007)

Although residents perceived the importance of the forest and could easily describe its benefits, including resource extraction, ecological services, esthetic and conservation benefits,

benefits of the park and park management were less evident. Although some people perceived the same benefits from the forest and the park, many people particularly in Cofradía and Jutiapa, appear to conceptualise the park as an administrative entity separate from the forest and do not perceive the benefits to be the same. Macura et al. (2011) found that local people had more positive attitudes toward forests that are more accessible to the communities than towards protected area where resources are less accessible. Many residents expected additional benefits from the park, such as economic or development benefits, beyond the benefits received from the forest. This lack of expected benefits stemmed largely from the lack of economic benefits to the community compared to perceived revenues of the park through funding and tourism. Likewise less than half of respondents saw benefits in AMITIGRA managing the park indicating that much of the issues or opposition of residents may stem from issues with management, the implementation of conservation regulations and the lack of compensation, rather than opposition to conservation itself. AMITIGRA was also seen to economically benefit from the park more than the community, emphasising the issue of lack of direct benefits to the community or individual residents. People from the communities at the two public entrances to the park, El Rosario and Jutiapa, were most likely to see AMITIGRA as benefitting from the park and more likely to raise the issue of lack of benefits. Thus it is likely that the expectation of benefits and the perceived lack of benefits are highly related to the view that other people are benefitting.

Residents of these communities see AMITIGRA earning revenue from tourism but do not see where this money is spent. These results are similar to those found by Pfeffer et al. (2006) in Cerro Azul Meambar National Park, Honduras where people thought of benefits of the park going to other communities or the nation as a whole rather than direct benefits going to themselves. The idea that local people feel benefits are unevenly distributed to other

communities or specific residents is expressed throughout the literature (Alexander 2007). In these studies it was common for people to identify park guards as benefitting from employment of the park but the idea that the institution managing the park was benefitting was much more common in LTNP than in other studies of park benefits. This outcome could be due to the unique co-management system used in Honduras where a NGO has the daily responsibility in the park rather than government institutions and may not be seen to be representing public interests. However, in CAMNP which has a similar co-management system beneficiaries were more likely to be identified as park guards rather than the NGO responsible for management of the park. Differences in this perception may result in a greater focus in CAMNP on participation (Barton 2001) than has been done in LTNP. Addressing issues of compensation and participation, as outlined below, may help mitigate the issue of lack of benefits.

Perceptions of benefits also relate to lack of transparency of AMITIGRA operations. AMITIGRA operational documents indicate that from 2001-2004 revenues from tourism accounted for 12% of total revenues of the organisation and costs associated with administration of tourism activities represent 8.4% of total costs (AMITIGRA 2005). The years included in this analysis include years in which large externally funded projects were operating and therefore in recent years tourism likely represents a larger percentage of total income. Recent financial statements indicate that with current total revenues to the organisation they would need to increase income by 25% to meet all the objectives of the management plan (ICF 2011). However, within the communities there is the perception that AMITIGRA makes a lot of money from grants and tourism and people do not see how this money is spent. Greater transparency and implementation of initiatives which provide direct economic benefits to the communities could mitigate this issue and lead to perceptions of more benefits from the park.

Expectation of benefits was related to the perception of AMITIGRA as a main beneficiary of the park which correlated with community location. Communities with better road access and potential for economic benefit were more likely to expect such benefits from the park. The communities of Jutiapa and El Rosario which have the highest potential for indirect economic benefits from tourism and have the most contact with AMITIGRA were more likely to expect benefits. Likewise Juncales and El Carbón, the more remote communities, were less likely to see AMITIGRA as a beneficiary or mention the issue of lack of benefits to the community. The community of Cofradía, however, does not fit this model of expectation of benefits based on location potential; the larger population and more diverse economy of this community as well as the influence of the common lands association in this area may account for the higher expectation of benefits. Location as a determinant of expectation of benefits is consistent with literature where communities with better road access and access to a variety of income earning opportunities have the highest expectation of personal benefits (Pfeffer et al. 2006). Higher expectations in these communities and lower in more remote communities in LTNP reflects an accurate representation of potential economic benefits in each area respectively. Other studies in protected areas indicate that where local losses, such as land use or resource extraction, are not compensated, negative perceptions of protected areas are likely (Alkan et al. 2009). Results of this study indicate that not just livelihood losses but location of the community and perceptions of who is gaining can influence attitudes towards protected areas and their management. Particularly in the communities of Jutiapa and El Rosario economic benefits from tourism should be developed or shared with the communities to mitigate this issue.

Issues related to lack of economic benefits to the community and land rights indicate the need for economic returns or compensation to residents of LTNP. Benefit sharing is viewed as

critical in gaining local support for conservation and can include honoring resource use rights, sharing of tourism revenues, infrastructure development and employment (Ferreira and Freire 2009, Tessema et al. 2010). Chan et al. (2007) suggest that community conservation projects often fail because local people bear most of the costs associated with conservation but still receive an inadequate share of the authority and benefits. This situation has often created mistrust and miscommunication between local people and management bodies (Chan et al. 2007).

Three main models of compensation are widely used. The first involves reimbursements paid to directly to stakeholders to compensate for the adverse impact of protected areas on the surrounding landscape (Pechacek et al. 2012). These largely include compensation for damage to crops by wildlife or limitations to livelihood activities from regulated restrictions. Although such programs work well in some situations and where funds allow for provision of generous compensation payment, they often are not completely effective because of problems associated with monetary valuation and its potential misuse (Pechacek et al. 2012). One such mechanism for economic returns is compensation to land owners for lost revenues associated with changes in land and resource management that further conservation aims (Cesareo and Daly 2004). Residents suggestions that they be provided compensation for forested lands that they cannot cultivate and the perception that other people are benefitting from community care of the forest indicates that compensation could aid in alleviating this issue in LTNP.

Another compensation model that has been successful is performance- or incentive-based compensation payments for easements, stewardships, and sustainable management of private lands (Pechacek et al. 2012). Incentive-based compensation is often incorporated into Payment for Ecological Services programs (Franco-Maass et al. 2008). This type of compensation may be

appropriate where changes in current livelihood practices could contribute to conservation on both forested and cultivated lands (Cesareo and Daly 2004). In this way a conservation payments program could provide incentive to residents to manage for conservation and compensate for potential economic losses due to such changes (Cesareo and Daly 2004). Developing several different criteria and avenues for compensation also ensures more equal distribution of benefits across social classes, land tenure, plot size and socioeconomic factors.

The Ecuadorian environmental services payment program Socio Bosque is a compensation program that is considered to be successful. This is a government led program that allocates direct economic benefits to local communities and individuals that commit to comply with specifically defined conservation activities. Characteristics of the program that are reported to have led to its success are that it has the objective of combining ecosystem conservation with poverty alleviation, it creates incentive and monitors local socio-economic investment outcomes, it is transparent and relatively straightforward, and has generated nationwide participation of local and indigenous communities (de Koning et al. 2011). The program also allows for individual or community participants to use the economic returns according to their needs and preferences as long as decisions are transparent and respect community agreements (de Koning et al. 2011).

The third area of return of economic benefits involves ensuring economic benefits from tourism are returned or developed in the communities. Tourism activities that promote awareness and income generation for local populations can also contribute to positive perceptions of protected areas and diversify the economies of local communities (Ferreira and Freire 2009). Maldonado and Montagnini (2005) indicate that tourism in LTNP is far from carrying capacity and that potential development of this industry is possible with corresponding

development of management capacity. Although some AMITIGRA led programs have aimed at creating alternative incomes or involving residents as tour guides these activities have largely been unsuccessful in creating a tourism economy in the communities. Ecotourism initiatives in many communities within protected areas have failed to deliver the expected benefits (Coria and Calfucura 2012). Implementation of such programs cannot be the only way of initiating benefits to the communities. However, tourism benefits can be successful when local communities have control over them, activities are compatible with the motivation, interest and needs of local people and when benefits are equitably shared (Cusack and Dixon 2006, Gurung and Seeland 2011). Participation of local people is needed at all stages of planning, implementation and evaluation of tourism in protected areas (Kala and Maikhuri 2011). Training and support to local communities including hard skills and skills related to finances, business and marketing are needed. Tourism projects should include goal-setting, partnerships and monitoring carried out by residents and AMITIGRA to ensure programs are successful (Cusack and Dixon 2006).

Besides interest in a tourism economy in the communities, residents of LTNP talked about a portion existing revenues from tourism such as entrance fees going back to the community. This could be facilitated through investment in community services and infrastructure thus creating a system in which benefits are more equally distributed (Coria and Calfucura 2012).

The Teribe River ecotourism project in Panama is considered to be highly successful (Cusack and Dixon 2006). The community is well-organised, has maintained control over the project and receives financial and technical support from an external NGO. Money from the project is used to pay salaries and community benefits. In this way the administration and

control of profits is a group effort and the benefits of the ecotourism project are shared among community members (Cusack and Dixon 2006).

This three part approach, compensation for lost revenue, incentives for conservation management through Payments for Environmental Services and benefits from tourism was successfully employed in the Monarch Butterfly Biosphere Reserve, Mexico (Rodríguez-Muñoz et al. 2012). Success of this program was partially attributed to involvement of the community in design and implementation of the compensation program.

The payment for environmental services initiative in LTNP has great potential for being part of compensation mitigation. However, given the ineffective communication surrounding this issue to date it is imperative that residents are properly consulted on this initiative in order to determine the most effective way of managing such compensation and involving communities in implementation. A lack of participation by stakeholders in determining appropriate compensation programs is a major hindrance to the success of such initiatives (Pechacek et al. 2012). Additionally, to ensure both conservation and economic objectives are being met by the program, AMITIGRA and the communities will also need to monitor the effects of the program to ensure that a both conservation and socio-economic changes are occurring. AMITIGRA should explore options to implement economic returns through compensation, incentives and tourism development.

Non-monetary incentives have also been found to be effective in building relationships with local residents and sharing benefits of the park. Such incentives can be created to fit the needs of the community and can include options such as securing legal title to land, providing technical assistance and supplies, or sharing public recognition for contributions (Cesareo and Daly 2004). The community management agreements are an example of this approach, where the

non-monetary incentives to participate included recognition of an environmental ethic and respect and control over local resources. Even though these incentives may not address all conservation and resource use concerns, a positive return is generated without investing much in the way of financial resources (Cesareo and Daly 2004).

Projects were mentioned as a benefit of the park and part of the positive perceptions of LTNP. Success of projects such as the water project and the eco-stoves can be built upon to further develop education and relationships between AMITIGRA and the communities. Generally environment and development projects aim to create economic incentives to change land and resource use in favor of conservation (Cesareo and Daly 2004). However, such projects do not necessarily create income substantial or secure enough to effectively alter livelihood practices and may not necessarily decrease unsustainable resource use (Cesareo and Daly 2004). Thus I propose that AMITIGRA projects be developed with the communities and have the aims of education, communication and relationship building in addition to conservation of resources rather than focussing solely on incentives to shift land use practices. Projects that are implemented with the sole purpose of economic incentive to change livelihood and land use activities may be less successful without the overarching aim of community participation in management. For example managers in AMITIGRA criticised the flower greenhouse project and noted that although people built and maintained the greenhouses, they used revenue as supplementary income rather than replacing agricultural income and changing land use practices. Conservation aims are more likely to be realised in projects that correlate directly to specific practices, how a resource is being used or when they are meant to increase local incomes rather than replace them (Cesareo and Daly 2004).

Communication and participation were also management issues mentioned by residents. Issues of communication were related to both the lack of knowledge of the roles and responsibilities of AMITIGRA and ICF and the lack of understanding of the community by AMITIGRA. Although some people, particularly in El Carbón felt that they had good communication with AMITIGRA due to the success of programs such as the water program, many people expressed that they felt that AMITIGRA acted more as an authority than they worked towards building relationships with the community. Results of this ineffective communication were observed in the interviews including comments about broken promises, rumours of relocation and knowledge surrounding the new payment for environmental services initiative. These issues led to greater resentment and opposition to AMITIGRA. Mistrust of administration as a result of ineffective communication and poor relationships can in turn lead to negative perceptions of protected areas (Oltremari and Jackson 2006). More regular outreach and formal methods for involvement of the community in management activities could lead to better communication and a reduction of negative perceptions as a result of misunderstanding of management activities and objectives (Ferreira and Freire 2009). Definitions of the responsibility of each key stakeholder (ICF, AMITIGRA and communities) are needed to ensure formal involvement of local people in park management.

Andrade and Rhodes (2012) found that local community participation in park management decision-making processes was significantly related to the level of compliance with protected area policies and regulation. The study also found that higher the level of participation led to higher levels of compliance. To date programs in LTNP that include local residents have been limited to “low” levels of participation such as workshops and conservation projects. This style of “low level” of participation involves residents for the purpose of conservation objectives

without effort to increase the capacity of the community to organise and be involved in decision making. The variety of ideas talked about by residents in the interviews about how the community could participate more in park management and the high number of people who thought there should be more direct involvement in management and in projects indicates an opportunity for AMITIGRA to involve community members. To achieve success with collaborative conservation managers must be willing to cede power, communities need to build critical capacities, and the social and environmental context must be appropriate (Gavin et al. 2007).

Successful experiences of participation in natural resource management can act as examples of how local people can form relationships with government and NGOs in park management. Such examples include agroforestry and community forestry and participatory land use planning (Del Amo-Rodriguez et al. 2010). A variety of mechanisms has proven effective in engaging local people when selected and adapted to the individual context such as community management and monitoring of natural resources, co-management or conservation agreements, advisory councils, consultation and consensus seeking (Borrini-Feyerabend 1996). One of the challenges in developing such management strategies is to determine which mechanism is most effective, how to adapt it to the specific context, and how to adapt and develop new tools to address new or changing circumstances (Cesareo and Daly 2004). Areizaga et al. (2012) argue that a successful participatory process should define who participates and when they participate, the process should be designed based on the level of participation required or preferred by stakeholders and evaluate if participation is effective. Evaluation can include indicators such as transparency, trust created, capacity building and mutual learning.

In the Cayos Cochinos Marine Protected Area on the north coast of Honduras, the managing NGO faced issues and complaints of mistrust, lack of transparency, low levels of participation, uneven involvement of stakeholders in management, and lack of compliance with conservation regulations (Bown et al. 2013). To deal with these issues they changed management practices to include more community involvement in decision making, respect for the voice of the community, more equitable compensation payments, greater recognition for property rights over natural resources, more financial transparency and enhanced public awareness of management activities. These changes led to more empowerment, transparency, accountability and equity in the relationship between the communities and the NGO and resulted in more compliance with regulation and an increase in support for the protected area (Bown et al. 2013). They later adopted a more adaptive management approach to deal with ongoing issues such as lack of leadership and organisation within the communities. Changes to address these ongoing issues led to greater involvement of residents and more flexibility in management activities to fit with local livelihoods and values. Although the managing NGO is still facing various management and participation issues, increasing engagement and acceptance of more adaptive management styles has gone a long way to improving the relationship with the local community.

Another successful mechanism to engage communities in natural resource management and planning is practiced in protected areas in Chile using local advisory councils. These councils act as a forum for communication, dialogue, and consensual decisions on managing the areas (Oltremari and Jackson 2006). These councils are engaged in decision making on-going process rather than a single event and are therefore able to respond to particular circumstances and contexts (Oltremari and Jackson 2006).

Literature shows that trust in natural resource management institutions is formed by perceptions of shared values between stakeholders and the institution as well as perceptions of equity or fairness in the decision-making process in cases where values or interests conflict (Davenport et al. 2007). Limited community involvement and power in decision making, as is evident in LTNP, can decrease trust that local values are represented in resource management decisions (Davenport et al. 2007). Accordingly trust developed through engagement and relationship building may evoke a deeper, emotional commitment and a sense of shared identity. However, since this trust has a higher potential for increasing negative perceptions if interactions are negative, natural resource management bodies should provide necessary training in public relations, conflict management and cultural awareness in order for such relationship building to be effective (Davenport et al. 2007). Davenport et al. (2007) recommend that managers should clearly communicate opportunities for involvement, motivate community members to get involved in all phases of management processes and hold activities at convenient times for community members. Decision making processes should include collaborative planning and be transparent on how community input is considered and implemented.

8.3 Conclusion

Placing results from this study of residents of LTNP and values and perceptions related to forest, the park and management within the theoretical context of the people and parks dilemma allows for creation of recommendations based on local values and perceptions and precedents from the literature on people and parks around the world. Recommendations based on the conclusions of this study are presented in Chapter 9.

Chapter Nine: Recommendations and Conclusions

9.1 Introduction

In this chapter I present a summary of recommendations to address issues related to livelihood needs and resource conservation in La Tigra National Park (LTNP) and overall conclusions of the study. Recommendations were developed through examination of key issues, resident interviews, key informant interviews and precedents from other protected areas. These recommendations are therefore specific to LTNP; however, key recommendations and conclusions contribute to the developing theory of parks and people relationships.

9.2 Summary of Recommendations

Knowledge and understanding of residents' conservation and livelihood values and issues were used to develop recommendations that may aid in improving the relationship between local people and conservation bodies and lead to more sustainable communities and better conservation of protected areas. A summary of recommendations from this study that are specifically relevant for LTNP in order of priority are:

- 1) Increase meaningful participation in park programs and management activities.
- 2) Increase transparency and communication of AMITIGRA and ICF.
- 3) Engage in regional collaboration and ideas sharing
- 4) Create a compensation and economic returns system.
- 5) Creation of community tree nurseries and planting program.
- 6) Facilitate a local system for resource extraction permit approval.

These recommendations are described in more detail below.

1) Increase meaningful participation in park programs and management activities.

The lack of direct participation in management activities was mentioned as an issue by residents. This issue is also apparent through the exclusion of communities from the formal co-management system between ICF and AMITIGRA. Managers should be trained in public communication and facilitation. Residents mentioned direct participation, participation in projects and education as the three main ways they could participate in the park.

Direct involvement should include participation in decision making related to the communities and park management such as delegating and enforcing more responsibility in the communities, creation of a local advisory council, use of liaisons between the community and AMITIGRA, community enforcement of regulations, or inclusion of the communities as part of the co-management agreement. Although AMITIGRA holds the primary responsibility for creating the organisational culture for participation in management, community leaders and organisations are also responsible for ensuring participation is meaningful. Formal definition of the responsibilities of each key stakeholder is necessary to ensure participation and accountability in decision-making.

Participation in projects is important for the success and effectiveness of conservation and community development projects. Projects should include community members in the planning, implementation and evaluation of the project and include both current conservation actions and priorities raised by residents. Including residents in development and planning of projects creates community empowerment, ensures projects are appropriate to the needs of the community and creates accountability of both community members and AMITIGRA for how projects are implemented.

Education programs that include two-way communication between AMITIGRA and residents and that value both formal and local knowledge are needed. These programs should draw on both conservation and livelihood values and issues. Education and communication of formal knowledge of LTNP, such as purpose of the park, zone boundaries and regulations is also important to ensure residents understand management activities. Residents expressed a desire for greater understanding between AMITIGRA and the communities as well as a role in education of community members. Creating a more participatory education strategy would create more common understandings of knowledge on both sides and may create more motivation for conservation actions and inclusion of residents in park management.

2) *Create transparency and accountability between AMITIGRA, ICF and the communities*

The co-management decree between AMITIGRA and ICF effectively disengages the communities from decision making processes and creates confusion around responsibilities of each group. Without a process in place there is no formal mechanism for creating accountability and transparency of management activities. A formal process should be developed where key roles are well defined and the communities are involved in decision-making processes.

Information on management activities and financial status of AMITIGRA should be available to the communities to help create trust between management bodies and local communities which would decrease perceptions of external bodies benefitting from local care of the forest and the park. Accordingly trust developed through engagement and relationship building may evoke a deeper, emotional commitment and a sense of shared identity and values.

3) *Engage in regional collaboration and ideas sharing*

Literature used as precedents in this thesis indicate that managers and communities within protected areas in Honduras and other areas of Central America have achieved some

successes in combining conservation and livelihood values in park management. Regional collaboration of governmental and non-governmental protected areas managers in Honduras and other Central American countries and of communities within protected areas could facilitate information and lessons sharing between groups. Areas of lessons sharing could relate to local participation in management, economic returns systems and sharing of control over natural resources. Formal information sharing and support could be facilitated through the government National Forest, Protected Areas and Wildlife Investigation System (SINFOR) conference or the Consultative Councils for Forests, Protected Areas and Wildlife (COCONAFOR) program. Less formal information sharing could be developed through innovative means such as web meetings for managers or tours and gatherings between community members in different protected areas to showcase and learn what has and has not worked within their parks and communities.

4) *Create a Compensation and Economic Benefit Return System.*

Return of economic benefits should focus on compensation for lost revenues, incentives for conservation based on specific performance agreements and return of economic benefits from tourism. This compensation or economic returns program needs to be developed, implemented and monitored with the communities to ensure it is most appropriate to their needs.

Issues related to lack of economic benefits to the community and land rights indicate the need for economic returns or compensation to residents of LTNP. Clarification of land rights is also needed to address this issue. Residents indicate compensation for forested lands that they cannot cultivate would aid in alleviation of this issue. Performance-based compensation could be developed to provide incentive to replant areas of private property or to manage resources for conservation purposes. The Payment for Ecological Services program through AMITIGRA and SANAA that is being developed has great potential for being part of compensation mitigation.

However, given the ineffective communication surrounding this issue to date it is imperative that residents are properly consulted on this initiative in order to determine the most effective way of managing such compensation and involving communities in implementation. Communities that benefit from the compensation program should also be responsible for local program governance and management of funds within their community.

Return of economic benefits from tourism, particularly to the communities of Jutiapa and El Rosario could be done in a number of ways. By involving communities in planning and implementation of tourism activities, programs will be more likely to be compatible with the motivation, interest and needs of local people. Programs that support residents in developing businesses after initial training in programs such as the tour guide training are imperative to ensure that small local tourism businesses can develop in the communities. Programs can include training and support in tourism and non-timber forest products as well as business management. The programs combined with a system or return of revenues from AMITIGRA into community services and infrastructure would alleviate issues around lack of economic benefits to the communities.

5) *Facilitate a local system of resource extraction permit approval and enforcement*

Local tree cutting norms and values of resources are largely in line with formal regulations; however, in some cases they did not align with local values and context. People felt that restrictions on cutting even dead trees were too stringent and were concerned with the difficulty or cost associated with getting a permit to cut a tree. This often led to illegal tree cutting and resentment towards AMITIGRA. Involvement of community authorities such as the town council or water committee in partnership with AMITIGRA and ICF in facilitating permits could reduce much of the tension around the permitting process for cutting trees. Park guards

could also be used to collect the required information and papers, reducing the need for residents to travel to the capital city and deal with the red-tape associated with obtaining a permit. A trial community agreement should be developed that gives an established or created community group the responsibility for implementing resource extraction regulations. This model could be used to create a legitimate local opportunity for participation in enforcement of regulations thus creating a direct line between sentiments of responsibility for caring for the forest and actual community action and responsibility.

6) *Develop a community nursery and tree planting program.*

Residents expressed local values of tree planting when talking of tree cutting norms, conservation activities and desired conservation activities. Regulations alone do not provide feasible alternatives for subsistence resource use of wood and trees. AMITIGRA runs their own tree nurseries and planting programs, often with paid local labour and community planting initiatives. Despite the presence of these nurseries and programs, residents felt that the programs did not meet their needs of planting trees on private property or planting trees that could be used for subsistence needs in the future. Such activities could be facilitated in the sub-zone of extensive use within the buffer zone. This program could be combined with an incentive-based compensation program for managing private land for conservation values including managing for local conservation values and use of resources on private property to replace extracting resources from the forests of the core zone. Partnerships between AMITIGRA and local water committees would facilitate the creation of such programs.

9.3 Future Research Needs

This study was largely exploratory and aimed to determine the range and relative prevalence of values and perceptions related to forests, park, park management and livelihoods in LTNP. Given this aim the study included a relatively small number of communities and interview participants. A larger representative study should be done in communities throughout the park to gain a better understanding of the values, attitudes and beliefs related to the forest, park and management.

Future research should be conducted on the most appropriate ways to facilitate involvement of the communities in management activities and compensation programs and decisions in LTNP should be made with the highest possible level of participation appropriate for the various activities and communities.

Research should also be conducted on land tenure within the park and changes in land use and land cover to identify where land use activities are most impacting the landscape and how communities and AMITIGRA can best work together to mitigate these impacts.

Only rural communities within the park were included in this study. Further research on expanding urban areas on the edges of the park, perceptions and priorities of these residents and impacts of these urban developments on park resources is also needed.

9.4 Conclusion

Most national parks, particularly in the tropics, are surrounded by human populations that interact with and use the forests and resources the park protects. This arrangement often leads to conflicts and issues between local people and protected areas management bodies. This study examines the relationship of residents of La Tigra National Park to the forest, park and park

management including values and perceptions of conservation and livelihood needs, identifies the key issues and provides recommendations on integrating conservation and livelihood into park management.

Although perceptions of forests, conservation and livelihoods were common throughout LTNP some perceptions and issues were more prominent in different communities. Table 9-1 outlines each community selected in the study and the predominance of key issues expressed in each.

Table 9-1 Percent of Residents Who Mentioned Key Issues by Community

Key Issue	Jutiapa	Cofradía	Juncales	El Rosario	El Carbón
Use of Wood and Permissions	69%	92%	33%	27%	70%
Land Rights and Ownership	38%	58%	11%	18%	30%
Land Use and Livelihood	15%	42%	33%	45%	30%
Lack of Direct Benefits to the Community	85%	83%	33%	55%	10%
Communication and Participation	69%	67%	11%	55%	30%

The community of Jutiapa is at one of the two main entrances to the park. Because of the location of the community and exposure to tourism and AMITIGRA activities residents of Jutiapa were also most likely to identify AMITIGRA as a beneficiary of the park and were more likely to perceive a lack of direct benefits to the communities as an issue. Despite the majority of park guards being based in Jutiapa few residents identified employment as a benefit of the park. This community was also concerned about the use of wood and permissions and lack of participation and communication.

Cofradía is located at the edge of the buffer zone and is largely removed from park management activities, other than an AMITIGRA run tree nursery in the community. Cofradía is also the most accessible community selected and has a more diverse economy with more people

working in Tegucigalpa. This community strongly expressed all the key issues identified in the interviews; however, the two main issues identified by residents in Cofradía were use of wood and permission and lack of direct benefits to the community. The perception in this community that prohibitions on use of wood extended to collecting dead and dry fallen wood was prominent. This caused people to feel that conservation of the area restricted even their most basic needs and led to negative perceptions of the park and management. Although the community of Cofradía does not fit the model of expectation of benefits based on location and tourism potential; the larger population and more diverse economy of this community may account for the higher expectation of benefits. Land rights were also more often mentioned in Cofradía than in other communities. This issue is particularly complicated in this community where a common lands association legally owns and manages a large area of common lands surrounding the community including agricultural lands, residences and forest. Much of this land is unavailable for agriculture or resource extraction under park regulations.

Although residents of Juncales expressed all of the identified key issues, perceptions of these issues were less prominent than in other communities. Juncales is more remote from tourism in the park as therefore were less likely to see AMITIGRA as a beneficiary or mention the issue of lack of benefits to the community. In Juncales the water committee and town council are actively involved in forest protection within the community and have informal penalties against tree felling and other resource extraction deemed harmful. Additionally the majority of residents interviewed in Juncales mentioned the aid received from AMITIGRA in rebuilding the community after it was destroyed by Hurricane Mitch in 1998. Likely due to this association, residents of this community were most likely to see the community as a beneficiary of the park.

Similar to Jutiapa, El Rosario is located at an entrance to the park. Residents of El Rosario were most likely to see AMITIGRA as a beneficiary of the park and were most concerned about lack of direct benefits to the community. Despite this, nine of the ten respondents who identified employment as a benefit were from El Rosario and only one was from Jutiapa. Residents of El Rosario were also largely concerned with lack of communication and participation in park management. This likely stems from a lot of contact with AMITIGRA but the perception that the community is not adequately involved in management activities. Land use and livelihood issues were mentioned more in El Rosario than in other communities.

In El Carbón no one mentioned AMITIGRA as benefitting from the park and all residents mentioned at least one benefit of the park. Residents from this community are far removed from tourism activities and also identified projects as a benefit of the park and of AMITIGRA and therefore they may see a more direct relation between revenues and where they are spent. Residents of El Carbón were most concerned about the use of wood and permissions. El Carbón is located far from the capital city and legally cutting a tree requires lengthy travel to AMITIGRA and ICF offices to obtain permission.

Although all communities mentioned key issues in the interviews, an understanding of the different contexts of each community and main perceptions and issues mentioned can aid in developing and adapting management solutions and recommendations to each particular context.

Although formal conservation knowledge was relatively low among residents in all communities of LTNP local forest values were evident. Residents expressed the importance of the forest particularly related to ecological services it provides, such as water and clean air. Although residents perceived the importance of the forest, could easily describe its benefits and

felt they were responsible for its care, many people did not translate these values to action. Residents also appeared to conceptualise the park as an administrative entity separate from the forest and did not perceive the benefits to be the same. Many residents expected additional benefits from the park, such as economic or development benefits, beyond the benefits received from the forest. This lack of expected benefits stemmed largely from the lack of economic benefits to the community compared to perceived revenues of the park through funding and tourism.

Issues with management were influential in developing perceptions of the park. Management issues raised by residents were largely related to lack of economic benefits, inefficient communication and local participation in management activities. Few people could see benefits of AMITIGRA managing the park and felt that AMITIGRA benefitted from park management as much as or more than the communities themselves. Thus it is likely that the expectation of benefits and perceived lack of benefits is highly related to the view that other people are benefitting.

Participation of the communities in park management was generally perceived to be low. Increasing participation in park management, education programs and projects is needed to ensure management is more locally appropriate and to mitigate issues of conservation and livelihoods. Other recommendations for integrating conservation and livelihood needs in the park are creation of a compensation and economic returns system, facilitation of a local system for resource extraction permit approval, creation of community tree nurseries and planting program and increasing transparency and communication of AMITIGRA and ICF.

While these findings and recommendations are specific to LTNP, this study provides a good example of the perceptions local people hold of protected areas and issues in park

management when various values are concurrently held both between communities and management bodies but also within communities or residents themselves. Integrating both local and general conservation values with local livelihood values is essential for effective park management and conservation success.

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Appendix A: GUIDE FOR AMITIGRA AND ICF KEY INFORMANT INTERVIEWS

Pregunta	Question
Información Demográfico	Demographic Information
Nombre	Name
Edad	Age
Actividades Económicas	Economic activities/occupation
Mayor ingreso	Activity that provides the greatest income
Salario mensual	Monthly salary
Nivel educativo	Level of education
Posee Tierras	Possession of land
Uso de Tierras	Use of land
Tamaño de Tierras	Size of land
Organización	Organisation
Primero hablamos de quién es usted y que hace aquí	First let's talk a bit about who you are and what you do
¿Qué es su puesto con AMITIGRA/ICF?	What is your position with AMITIGRA/ICF?
¿Qué tipo de capacitación ha recibido en el puesto que le ayuda hacer el trabajo?	What types of training have you received in this position to help you do the work?
¿Cuánto tiempo ha trabajado con AMITIGRA/ICF?	How long have you worked with AMITIGRA/ICF?
¿Cuáles son sus responsabilidades?	What are your responsibilities?
El Bosque de PNLT	Forests in LTNP
¿Por qué existe el Parque? (¿para qué sirve?)	Why does the park exist? (for what purpose?)
¿Cuáles son los beneficios de tener el Parque?	What are the benefits of having the park?
¿Cuáles son los inconvenientes de tener el Parque?	What are the costs of having the park?
¿Quién se beneficia del Parque?	Who benefits from the park?
¿Cuáles son los daños o problemas en tener el parque?	What are the dangers or problems with having the park?
¿A quién le perjudica el Parque?	Who is harmed by the park?
¿Usted cree que es justo que unos se benefician del parque y a otros se hace daño?	Do you believe that it is fair that some people benefit and other are harmed?
Cambios en le Parque	Changes in the Park
¿Cómo ha cambiado el parque desde que usted empezó trabajar aquí?	How has the forest in the park changed since you started working here?
¿Por qué cree usted que ha habido estos cambios?	Why do you think there have been these changes?
¿Cuáles han sido los resultados de estos cambios?	What has been the result of these changes?
¿Quién tiene la responsabilidad de cuidar los bosques y los árboles? (¿un ejemplo?)	Who is responsible for caring for the forests and the trees? (An example?)
El Manejo	Management
¿Quién tiene la responsabilidad de cuidar el parque?	Who has the responsibility to care for the park?
¿Cuáles son los objetivos de ICF?	What are the goals of ICF?
¿Cuáles son las responsabilidades de ICF cuales tiene a ver con PNLT?	What are the responsibilities of ICF related to LTNP?

¿Cuál es la diferencia entre ICF y COHDEFOR?	What is the difference between ICF and COHDEFOR?
¿Qué es el propósito de AMITIGRA?	What is the purpose of AMITIGRA?
¿Cuáles son las responsabilidades más urgentes de AMITIGRA? ¿Cuáles de estas responsabilidades ocupan el más tiempo?	What are the most urgent responsibilities of AMITIGRA? Which of these responsibilities occupy the most time?
¿Cuáles son los éxitos entre el convenio de comanejo entre ICF y AMITIGRA?	What are successes of the co-management agreement between ICF and AMITIGRA?
¿Cuáles son los problemas de las relaciones entre ICF y AMITIGRA?	What are the problems in the relationship between ICF and AMITIGRA?
¿Cuáles son las fortalezas de AMITIGRA/ICF de manejar el parque?	What are the strengths of AMITIGRA/ICF in managing the park?
¿Cuáles son los obstáculos que tiene AMITIGRA/ICF de manejar el parque?	What are the obstacles of AMITIGRA/ICF in managing the park?
¿Cuáles son los objetivos del plan de manejo que han comenzado o logrado hasta ahora?	Which objectives of the management plan have you started or achieved?
Problemas del Parque	Problems of the Park
¿Cuáles son los mejores problemas del parque?	What are the major problems of the park?
¿Cómo cree usted que se podrían resolver estos problemas?	How do you think these problems could be resolved?
¿Cuáles son los obstáculos que tiene AMITIGRA/ICF de resolver los problemas?	What are the obstacles that AMITIGRA/ICF has to resolve these problems?
¿Cuáles programas de AMITIGRA/ICF concentra a la protección de los recursos naturales de PNLT?	Which AMITIGRA/ICF programs focus on protection of natural resources in PNLT?
¿Cuáles programas de AMITIGRA/ICF concentra a la desarrollo de las comunidades de PNLT?	Which AMITIGRA/ICF programs focus on development of communities in PNLT?
¿Qué cree usted que le pasaría a los bosques y a los árboles si el Parque fuera eliminado?	What do you believe would happen to the forests and trees if the park were eliminated?
Participacion de las Comunidades	Community Involvement
¿Cómo son las relaciones entre las residentes y AMITIGRA/ICF?	How is the relationship between the residents and AMITIGRA/ICF?
¿Cómo involucra las comunidades en el manejo del parque, AMITIGRA/ICF?	How does AMITIGRA/ICF involve the communities in park management?
¿Cuáles programas o proyectos tiene AMITIGRA?	What programs or projects does AMITIGRA have?
¿Cuáles son los éxitos de las relaciones entre ICF/AMITIGRA y las comunidades de PNLT?	What are the successes in the relationship between AMITIGRA/ICF and the communities in PNLT
¿Cuáles son los problemas de las relaciones entre ICF/AMITIGRA y las comunidades de PNLT?	What are the problems in the relationships between AMITIGRA/ICF and the communities in PNLT
¿Cree usted que las comunidades deben participarse más o menos en el manejo del parque?	Do you believe the communities should participate more or less in park management?
¿Cuáles son los beneficios de involucrar las	What are the benefits of involving the

comunidades in el manejo del parque?	communities in park management?
¿Cuáles son los costos de involucrar las comunidades in el manejo del parque?	What are the costs of involving the communities in park management?
Quien tiene la responsabilidad de involucrar las residentes?	Who is responsible for involving residents in in park management?
Lograr Objetivos	Achieving Goals
¿Cuáles recursos le falta AMITIGRA/ICF para lograr los objetivos?	What resources does AMITIGRA lack in order to meet their goals?
¿Cuáles recursos tiene AMITIGRA/ICF para lograr los objetivos?	What resources does AMITIGRA have in order to meet their goals?
¿Cuáles recursos le faltan las comunidades para lograr los objetivos?	What resources do the communities lack in order to meet their goals?
¿Cuáles recursos tienen las comunidades para lograr los objetivos?	What resources do the communities have in order to meet their goals?

Appendix B: GUIDE FOR RESIDENT INTERVIEWS

Pregunta	Question
Bosques – preguntas generales	Forests – general questions
¿Usted piensa que los bosques y los árboles son importante o no? ... ¿Por qué?	Do you think that forests and trees are important or not? Why?
Bosques en la comunidad y en la región Primero nos gustaría hablar acerca de los bosques que hay en su comunidad y en las áreas cercanas. Después nos gustaría hablar de los bosques que hay dentro de su propiedad.	Forests in the community and in the region First we would like to talk about the forests that are in your community and the surrounding areas. After we would like to talk about the forests that are on your property.
¿Usted ha notado un cambio en los bosques a raíz desde muy pequeño hasta este tiempo. ¿Qué cambios ha notado?	Have you noticed a change in the forests from when you were small until now? What changes have you noticed ?
¿Por qué cree usted que ha habido estos cambios?	Why do you think there have been these changes?
¿Qué resultados ha visto usted a través de estos cambios?	What results have you seen from these changes?
Nos gustaría hablar un poco sobre la corta de árboles	We would like to talk a bit about cutting of trees
¿Considera usted que a veces es bueno cortar árboles? ... ¿Por qué?	Do you think that sometimes it is okay/good to cut trees? ... Why?
¿Qué cree usted que pasaría si alguien en la comunidad se pone a cortar árboles?	What do you think would happen if someone in the community (decided to) cut down trees?
<i>Probe: ¿Cómo reaccionaría la comunidad?</i>	<i>Probe: How would the community react?</i>
Montaña dentro de la comunidad	Forests within the community
¿Quién tiene la responsabilidad de cuidar los bosques y los árboles? (¿un ejemplo?)	Who is responsible for caring for the forests and the trees? (an example?)
¿Usted todos los conocimientos que tiene de los que nos ha conversado ahorita como lo ha adquirido o aprendido?	How did you acquire or learn all the knowledge that have told us about?
Parques forestales	Forested Parks
¿Usted sabe que es un área protegida? ¿Para usted, que es un área protegida?	Do you know what a protected area is? What is a protected are to you?
¿Ha oído hablar del Parque Nacional La Tigra	Have you heard of La Tigra National Park?
¿Usted sabe en qué zona del Parque Nacional La Tigra vive? <i>¿En la zona núcleo, en la zona amortiguamiento, la zona intermedio?</i>	Do you know what zone of the park you live in? <i>In the core zone, the buffer zone, an intermediate zone?</i>
¿Usted sabe para qué existe el parque? ¿Para qué propósito?	Do you know why the park exists? What is its purpose?
¿Qué cree usted que le pasaría al bosque o los arboles si dejara de ser una área protegida?	What do you think would happen to the forests and trees if the area stopped being a protected area?
¿Para usted cree que existen beneficios de vivir dentro de un área protegida? ¿Cuáles son?	Do you think there are benefits to living in a protected area? What are they?
¿Quién se benefician del área protegida o de	Who benefits from the protected area La Tigra

Parque Nacional La Tigra?	National Park?
¿Qué problemas cree usted que existe a vivir dentro de un área protegida?	What problems do you think there are of living in a protected area?
¿Usted cree que es injusto unos benefician y otros no?	Do you think it is fair that some people benefits and others do not?
El Manejo	Management
¿Quién maneja el parque? ¿Ha oído hablar de la Fundación AMITIGRA? ¿Ha oído hablar de ICF lo que anteriormente llamamos COHDEFOR?	Who manages the park? Have you heard of the AMITIGRA Foundation? Have you heard of ICF, previously called COHDEFOR?
¿Usted, como se enteró de la existencia de AMITIGRA? ¿De la presencia de AMITIGRA?	How did you learn about the existence of AMITIGRA? Of the presence of AMITIGRA?
¿Usted sabe cuáles son las obligaciones o responsabilidades que tiene AMITIGRA aquí?	Do you know what obligations or responsibilities AMITIGRA has here?
¿De las responsabilidades que ICF o antes COHDEFOR, sabe usted cuál es?	What are the responsibilities of ICF or previously COHDEFOR?
Participación de las Comunidades	Community Participation
¿Cómo siente usted que andan las relaciones entre los residente de la comunidad y AMITIGRA? ¿ICF?	How do you feel the relationship is between the residents and AMITIGRA? ICF?
¿Usted ha participado en alguna programa de AMITIGRA?	Have you participated in any programs by AMITIGRA?
¿Usted cree que hay beneficios, y cuáles son los beneficios de que AMITIGRA este manejando el parque?	Do you think there are benefits and what are benefits that AMITIGRA is managing the park?
¿Usted cree que los residentes de aquí de la comunidad deben participar más o no participar dentro del manejo del parque? ¿Cómo pueden participar más?	Do you believe the residents of the park should participate more or not participate in park management? How could they/you participate more?
¿Qué más le gustaría que haga AMITIGRA?	What more would you like AMTIGIRA to do?
¿Cuáles son las cosas que falta la gente o comunidad para poder desarrollar sin hacer daño al bosque?	What does the people or the community lack in order to develop without harming the forest?
El Uso del Parque	Use of the Park
¿Cuáles son las cosas que utiliza del bosque?	What sorts of things do you use from the forest
¿Y de dónde obtiene usted estos recursos?	Where do you collect these things?
¿Qué actividades realiza usted para la conservación del bosque o de los recursos naturales?	What activities do you do to conserve the forest or natural resources?
¿Que quisiera hacer usted en cuanto la conservación del bosque o de los recursos naturales que utiliza?	What would you like to be able to do to conserve the forest or the resources that you use?