

LOCAL PEOPLE AND PROTECTED AREAS

- a case study from Mirafior, Nicaragua

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Abbreviations/Glossary

APB	<i>Proyecto de Apoyo a las Áreas Protegidas y Biodiversidad</i> ; Protected Areas and Biodiversity Support Programme
APROAMI	<i>Asociación de Productores Ambientalistas de Miraflores</i> ; Association of the Environmental Producers of Miraflores
<i>Asentamiento</i>	A settlement established by the government during the civil war in Nicaragua.
<i>Campesino</i>	Agricultural producer who is owner of the land and produces mainly for subsistence; in Nicaragua <i>campesino</i> often means any person who lives in the countryside and owns some agricultural land.
Córdoba	Monetary unit of Nicaragua. 1 córdoba = 0,43 FIM = 0,067 USD (in May 1999).
INAFOR	<i>Instituto Nacional Forestal</i> ; National Forestry Institute.
IRENA	<i>Instituto de Recursos Naturales</i> ; Institute of Natural Resources, institute which was previously responsible for matters now handled by MARENA
IUCN	World Conservation Union
<i>Latifundio/ latifundista</i>	Extensive land property/ owner of an extensive land property
MARENA	<i>Ministerio del Ambiente y de los Recursos Naturales</i> ; Ministry for Environment and Natural Resources of Nicaragua
<i>Manzana</i>	0,7 hectares
MFAF-DIDC	Ministry for Foreign Affairs of Finland, Department for International Development Co-operation
NGO	Non-governmental organisation
PANIF	<i>Programa Ambiental Nicaragua-Finlandia</i> ; Environmental Co-operation Programme Nicaragua-Finland
SFN	<i>Servicio Forestal Nacional</i> ; National Forestry Service, institute which was previously responsible for matters now handled by INAFOR
SINAP	<i>Sistema Nacional de Áreas Protegidas</i> ; National System of Protected Areas
UCA-Miraflores	<i>Unión de Cooperativas Agropecuarias 'Héroes y Mártires de Miraflores'</i> ; Union of Agricultural Co-operatives 'Héroes y Mártires de Miraflores'
WCMC	World Conservation Monitoring Centre

1 Introduction

1.1 Background

Biodiversity is currently one of the most discussed issues on the global environmental agenda. The topic received significant attention at the United Nations Conference on the Environment and Development (UNCED) held in 1992 and at its follow-up in 1997, Earth Summit+5¹. A number of reasons, such as the increased use of natural resources, the alteration of habitats for building of infrastructure, monocultivations and the expansion of agricultural frontier have led to the loss of biodiversity.

The Convention on Biological Diversity adopted in the Earth Summit in 1992 recognised that networks of protected areas are central to conserving biodiversity and urged the contracting parties to establish appropriate systems of protected areas for *in situ* conservation (UN/UNEP 1992, article 8). Consequently, one of the main reasons for the establishment of a great number of protected areas all over the world in recent years has been the protection of biodiversity, although protected areas can also have many other purposes, such as landscape protection or watershed protection. Furthermore, the first protected areas established at the end of 19th century were created for fairly different reasons than the current ones. In all, the philosophy of protected areas has gone through different phases throughout the decades.

The current controversy is the role of the local people² in protected areas and their management. This topic is especially relevant in the so-called developing countries, or in the South³, which host both the majority of the world's population and the majority of the world's biological richness. The countries in the South are

¹ The concrete results of these conferences can be questioned. However, that discussion is beyond the scope of this study.

² With the term *local people* I refer to any people living close to the area in question, not to any specific social or, especially, indigenous group.

³ This study does not go into details on *what is development*. I have chosen to use the term *the North* when referring to countries occupying the first places of the listing in United Nations Human Development Report (cf. UNDP 1999), and similarly *the South* when referring to countries occupying the later places.

the source of an estimated 90% of the world's store of biological resources, while at the same time hosting approximately 78% of the world's population (UNDP 1999, 70, 200). It is estimated that Latin America alone hosts approximately 40% of the world's biodiversity (Sánchez Sosa 1999). The need for agricultural land, unequal land tenure, extensive cattle raising, timber logging and other reasons have created multifaceted conflicts in and around protected areas in the South. Several attempts have been made throughout the world to combine the protection of biodiversity and the needs of local people in protected area management (cf. e.g. Ite 1996; Kothari *et al.* 1995). However, many of these programmes have failed to reach their objectives, and much remains to be explored in how to satisfy the needs of human inhabitants while at the same time conserving biological richness.

1.2 Research aim

This study focuses on protected areas with considerable human populations inside the area or in its buffer zone. The aim of the study is to analyse the needs and expectations of different people and different interest groups affected by the conservation schemes, and to examine the possibilities of taking the local opinions into account in the management of protected areas.

The issue will be studied in detail through a case study of the Miraflores Nature Reserve in Nicaragua. The aim is to understand how the protection scheme of this particular area has been constructed and how the local attitudes toward protection have evolved from past to present. At the same time, the research aims to set the case of Miraflores into the broader context of conservation and sustainability, in order to make suggestions on the basis of the experiences in Miraflores about the protected area management in situations where there is a significant amount of human settlements inside the protected area. As Yin (1994, 38) remarks, case studies allow the possibility to generalise theories (analytic generalisation) even though they do not suffice for statistical generalisation.

In brief, the **research problems** of this study are:

1. To analyse what are the expectations and the perceptions of different interest groups towards the Miraflor protected area.
2. To examine what kind of challenges, if any, the experience of Miraflor can offer in order to clarify the current conceptions of protected areas.

Miraflor was chosen as a case study area because it was considered to be a representative example of the protected area management problematics in Latin America. Like most protected areas in Nicaragua, as elsewhere in Latin America, Miraflor has a relatively dense human population within its boundaries. It is established in privately owned lands, which is the case in most of the protected areas in Nicaragua. Furthermore, my access to documentation and to the area itself was facilitated due to the fact that Miraflor is a pilot area of a Finnish environmental co-operation programme in Nicaragua. More detailed information on Miraflor and the Finnish development project will be given in chapter 3.3.

The main focus in this study is on protected areas in the South, and especially in Latin America. The context of protected areas in the North, such as Finland, is considerably different. Even though there are inhabitants within many protected areas in the North as well, the question of local people and protected areas is much more complex and relevant in the South. In the North, the livelihood of the local people usually does not depend to the same extent on the use of the natural resources of the protected area, as it does in the South.

The carrying capacity of the area, and other factors in reference to conservation biology theories on protected areas, such as optimal size of the area, or the possibility of species to interact with each other is, beyond the scope of this study, which concentrates mainly on the role of local people in the protected area management. Theoretically, the study relies on those approaches that aim to link the issues of nature protection with the questions of social sustainability and the livelihood requirements of the local people.

1.3 Protected areas: the dilemma of equity and environmental protection

One of the fundamental philosophical questions in environmental protection is the status of human beings *versus* the rest of the nature. Which is to be given preference, human survival or maximum protection of the nature? Establishment of protected areas is one of the major mechanisms in protecting the world's biodiversity. Given the current pace, in which the alteration of habitats takes place, it is essential to continue to have protected areas in the future as well. However, the majority of the current protected areas either has inhabitants within their boundaries, or has had human populations before they were moved from the area and replaced into other zones.

Concerning this, it is essential to pay attention to the questions of social equity when talking about the environmental protection, or as Vandana Shiva (1992, 32) puts it: "*The protection of biodiversity must be based on ecology and equality*". For instance, the price of environmental protection, or environmental degradation, should not be paid by the poorest segments of the population in the South, if it is in the industrialised countries where most of the utilisation of natural resources takes place. In the South, likewise, there are significant differences in the control and access over natural resources between different social actors, thus the question of natural resource utilisation is also an issue of human rights and social equity. It is important to develop land use practices which allow fundamental human needs to be fulfilled, but which at the same time diminish the environmental degradation and the loss of biological richness to as minimal as possible. Protected areas provide a concrete and highly relevant example of this dilemma, and this is one of the reasons why I have chosen protected area management as the major topic in my analysis.

The next chapter explains how the concept of protected areas has changed during the history and how the discourses on protected areas are linked to North-South issues. Background information of Nicaragua, its protected areas and of the Miraflor Nature Reserve will be presented in chapter 3. Chapter 4 will describe how the material on Miraflor was collected and analysed, while the case study of Miraflor will be analysed in chapter 5. The conclusions will be made in chapter 6.

2 The past and present of protected areas

2.1 The current situation of the world's protected areas

Protected areas are considered to play an important role in conserving biological diversity (cf. WRI 1992; Wells & Brandon 1993). In the IV IUCN Congress on National Parks and Protected Areas, held in Caracas, Venezuela, in 1992, this role was emphasised by defining a *protected area* as follows:

"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." (IUCN 1994, 7.)

It is important to note that protected areas are established also for other purposes than biodiversity protection. These include scientific research, maintenance of environmental services (such as maintaining air quality or protecting watersheds), protection of specific cultural and natural features, tourism and recreation, education, and sustainable use of natural resources (IUCN 1994, 7).

By the end of 1996, 8,8% of the total land area of the globe, or 13,2 million km², was protected (these figures including marine components as well). This refers to sites that meet the above mentioned IUCN criteria of a protected area, and which are included in the management categories of the IUCN classification of protected areas⁴. According to the latest IUCN listing in the beginning of 1997, the total number of protected areas around the world summed up to 12 754. (IUCN 1998, 301.) In Central America the number of protected areas increased from 30 areas in

⁴ Areas under 1000 ha and privately established (not legally designated by the state) protected areas are not included. Offshore islands of at least 100 ha are included, when the entire island is protected. There are six categories of protected areas defined by the IUCN (1994). Category Ia *Strict Nature Reserve*: protected area managed mainly for science; Ib *Wilderness Area*: protected area managed mainly for wilderness protection; II *National Park*: protected area managed mainly for ecosystem protection and recreation; III *Natural Monument*: protected area managed mainly for conservation of specific natural features; IV *Habitat/Species Management Area*: protected area managed mainly for conservation through management intervention; V *Protected Landscape/Seascape*: protected area managed mainly for landscape/seascape conservation and recreation; VI *Managed Resource Protected Area*: protected area managed mainly for the sustainable use of natural ecosystems.

1970 to 384 protected areas in 1996, covering 15,9% of the total land area, or 86 049 km² (Richards 1995, 1; Green & Paine 1997, 13). In 1997 the Protected Areas Database of the World Conservation Monitoring Centre (WCMC), in which data on the world's protected areas is collected, held 30 350 records of protected areas (includes also 17 892 areas which are under 1000 ha), plus 13 915 records of areas which are designated to protection, but do not fulfil the criteria of a protected area according to the IUCN definition (Green & Paine 1997, 5). The growth of the number and extent of protected areas in the 20th century is presented in Figure 1.

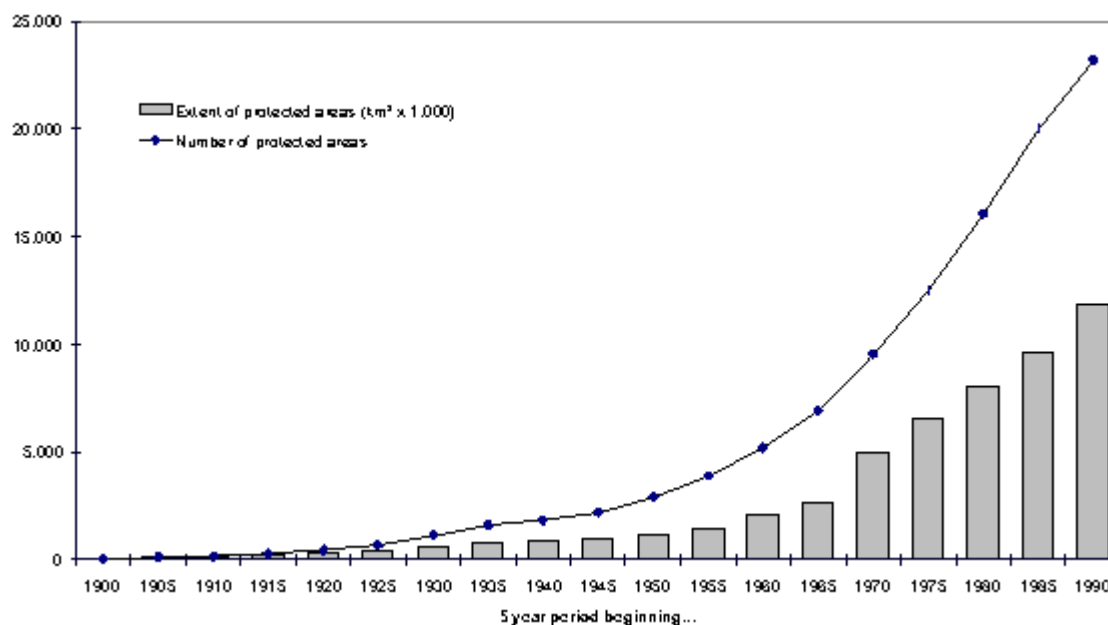


Figure 1. Cumulative growth in the number and extent of protected areas 1900 -1994 (Green & Paine 1997, 7).

There are also internationally designated protected areas, such as Biosphere Reserves and World Heritage Sites designated by UNESCO, wetlands protected under the Ramsar Convention, marine areas protected under the Helsinki Convention and the Barcelona Convention, Biogenetic Reserves of the Council of Europe, the protection of Antarctic through the Environmental Protection Protocol of the Antarctic Treaty, and areas designated to protection through directives of the European Commission (Birds Directive, Habitats Directive/Natura 2000)

(*ibid.*, 19). Furthermore, privately established protected areas form a significant part of the total area under protection, especially in Africa, although accurate data is not available on the topic (cf. Green & Paine 1997).

The rapid growth in the number of protected areas in the past decades reflects the increasing concern of the state of the environment. Ever since the Club of Rome and the UN Conference on the Human Environment in the 1970s, one of the principal topics in the global agenda has been the dwindling natural resources, including the depleting natural environments. Establishing protected areas has been one solution to this situation. The influence of different international agreements on nature conservation, the growth of ecotourism, the need to protect watersheds and other reasons have urged countries to widen their network of protected areas. Sometimes, like in the case of Nicaragua, this has meant establishing protected areas on private lands, since many of the environmentally significant areas have long been under private ownership.

2.2 Wilderness for visitors – the first protected areas

The first recordings of some kind of protection of specific areas date back to China and India for 2000 years ago. These nature preserve areas were dedicated to gods and animals. Similar kinds of areas were the holy lands of the North American Indians. However, these were not protected areas in the similar way as nowadays understood, rather they were communally owned lands where land-use was controlled by traditional customs and rules. The first protected area in the world is considered to be Bialowieza in Poland, its protection dating to 14th century. (Borg & Ormio 1978, 6.)

In Africa and Asia, many of the protected areas in the 19th century were established to serve as hunting resorts for the colonisers (Kothari *et al.* 1997). Also in Europe large-scale landowners and royal families interested in hunting had established game preservation areas in their estates, ever since the 16th century (Borg & Ormio 1978, 12). Colonial regimes established forest reserves in their protectorates also for commercial purposes, this in order to secure the raw

material, such as timber or quinine, for the growing markets. Furthermore, in the early 20th century the colonisers set up protected areas to maintain satisfactory climatic and hydrological conditions. (Fairhead & Leach 1994, 481, 501.) The first protected areas in the South were, therefore, usually created to meet the colonial economic interests, while overlooking the aspirations of the local inhabitants.

The idea of protected areas as isolated parks evolved in the United States during the late 19th century. The preservationism arose from the increased pressure that the European immigrants and their pursuit of free land placed on the wilderness areas in North America. The first national park in the world, the Yellowstone National Park, was created in the United States in 1872 on the lands of native Americans⁵. Its establishment resulted in bloody conflicts between the indigenous groups and park officials, because the native people were displaced from the area and assigned a separate reserve to live in. Yellowstone became a long-term model for protected areas worldwide, according to which wilderness areas were only for human recreation and reverence for nature. Human people were not accepted to live inside the protected area nor were they allowed to use the area for extractive purposes. (Kemf 1993.) This was based on the concept of wilderness as something untouched and untouchable, and consequently, as an area without people (Gómez-Pompa & Kaus 1992, 272).

By 1900, there were 50 protected areas around the world (IUCN 1998, 301). The dominance of the Yellowstone model was prominent even in 1969, when IUCN held its 10th General Assembly and formulated a definition of the term *national park*. The fundamental idea was that there is or will be no human population within the national parks. At the same time, each national park was to be divided into wilderness zones and transition zones (Kothari *et al.* 1997, 274). The area under absolute protection, without any human population, was called wilderness zone and the surrounding area with gradual shift from the protected to the non-protected area was called transition zone. Later the terms core area (nuclear area)

⁵ Even though Yellowstone is commonly regarded as the first national park, in fact, there were some earlier initiatives. The Hot Springs National Reservation was established in 1832, and the State Park Yosemite in 1864. (Borg & Ormio 1978, 6-7.)

and buffer zone (see Figure 2), became widely used tools in the protected area management.

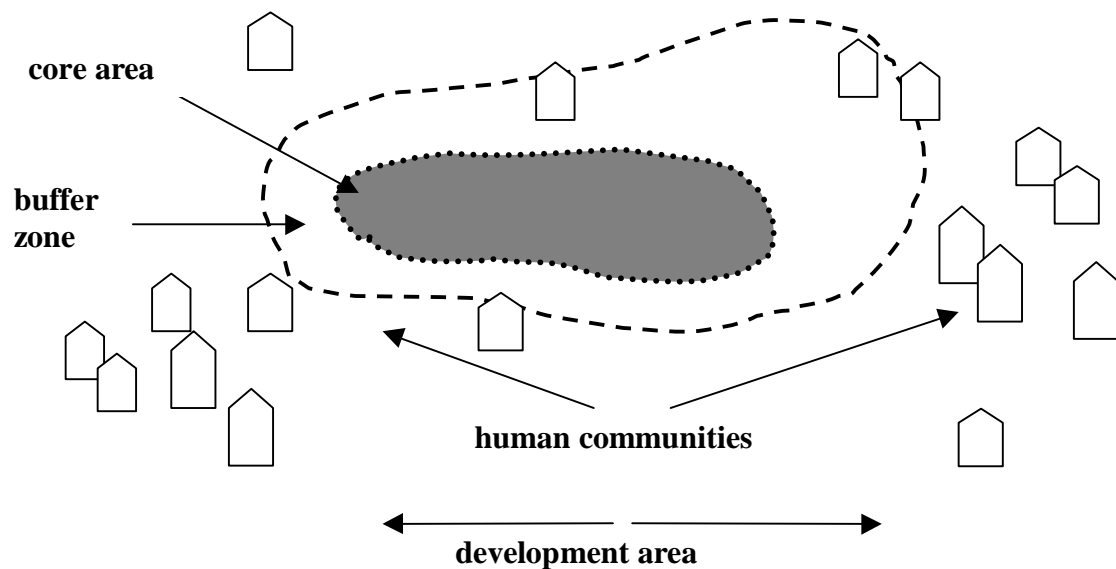


Figure 2. Core area and buffer zone of a protected area.

The core area was for strict protection of natural ecosystems, while the buffer zone was for impeding the negative impacts of development in the core area, and for acting as a smoothing transition zone from the non-protected development area to the totally protected area. Only a small, controlled amount of local inhabitants was accepted to live in the buffer zone, and their production systems and livelihood strategies were required to be environmentally sound. The development area was for larger human population and for more intensive economic activities.

The aim of the traditional protected areas was to preserve the nature for recreational, cultural and scientific purposes. This view on protected areas has later been called "fines and fences" -philosophy. Human activities, other than tourism or research, were not accepted within the area, which was therefore somehow "fenced" apart from the outside world. If someone crossed the fences without permission, and used the natural resources of the area, strict punishments, such as fines, would be applied. Especially in the earlier years, the main focus of

preservationism was on protecting highly visible species, such as elephants and giraffes in Africa, or turtles and toucans in Latin America.

According to Richards (1997, 1), such "fines and fences" -approach is based on the perception that biodiversity degradation is a problem of "*man's inhumanity to nature*". On this basis, conservation authorities have attempted to keep people out of an ever-increasing area under protection. This has resulted in many conflicts, as the controlling of vast areas is difficult with little resources. Richards himself argues that the real problem in biodiversity conservation is more like "*man's inhumanity to man*", such as unequal utilisation of the resources and violence of human rights in the control over natural resources, which are common features for example in the expansion of the agricultural frontier. In reality, the success of conservation depends largely on governmental policies, land tenure, agrarian legislation and institutional relationships, and how these mechanisms affect the individual resource-users (Wells & Brandon 1992). The "fines and fences" - approach is criticised for applying the end-of-pipe -technique to protection, instead of tackling the causes. Alternative perspectives state that the protected areas can not be protected by closing them tightly from the outside world, but by paying more attention to the problems that ultimately make people to degrade their environment (cf. e.g. Richards 1995, Wells & Brandon 1992).

2.3 New approach to protected area management – the role of the local people

The number of protected areas in the world has increased particularly during the past 30 years. At the same time, there has been a transformation from species-protection to a wider ecosystem-protection, and especially in recent years biodiversity protection has become one of the most important issues in different conservation programmes (Dompka 1995). While protected areas have grown in size and number, so has the world's human population. Therefore an increasing number of protected areas have and will be established in areas (traditionally) inhabited by humans (Orlove & Brush 1996; Wells & Brandon 1993). In Latin America 86% of the existing protected areas are established in areas inhabited by

people, world-wide the figure is approximately 70% (Ghimire & Pimbert 1997, 7). In this situation, the question of local people's position *versus* protected areas has become a highly relevant and widely discussed issue.

Already in 1976 UNESCO, through its Programme on Man and Biosphere (MAB), proposed the creation of a biogeographically representative network of Biosphere Reserves in the sites of worldwide significance. In this case, the inhabitants of protected areas were for the first time taken into account, as the MAB-programme put emphasis on human beings as an integral part of the ecosystem and on the necessity to involve local inhabitants in conservation activities. (Kothari *et al.* 1997, 276.) The overall management objective of Biosphere Reserves was defined as integrating conservation of biodiversity with the sustainable use of natural resources for the benefit of local communities.

This perception was strongly emphasised some 15 years later, when the IV IUCN World Congress on National Parks and Protected Areas pointed out that the view of protected areas as islands apart from the surrounding areas and neighbouring human communities should finally be left aside (McNeely 1992). Consequently, the Congress took the phrase "Parks for Life" as its slogan, and urged the governments to recognise the needs and aspirations of the people living in and around the protected areas, as well as to take appropriate measures in order to ensure that the local communities were not disadvantaged by protected areas (IUCN 1993, 36). Also, as a result of the congress, a new category was introduced to the IUCN list of protected areas. Category VI, "Managed Resource Protected Area: protected area managed mainly for the sustainable use of natural ecosystems". This category was to be assigned on those areas "*managed to protect their biodiversity in such a way as to provide a sustainable flow of products and services for the community*" (IUCN 1994, 9).

In recent years several researchers have stressed the role of the local people in the successful management of protected areas. According to Wells & Brandon (1993), there is a growing recognition that the sustainable management of protected areas ultimately depends on the co-operation and support of the local people. Similarly, Kothari *et al.* (1995) argue that a protection strategy that alienates local

communities from conservation is not only unjust to human rights but also harmful to conservation. Guidebooks for protected area managers stress the importance of involving local people in the decision-making and management of a protected area (cf. e.g. IUCN/CNPPA 1994, *Parks* 1998). In general, the previously described "fines and fences" policy is considered to have become an obsolete approach. The local people are often seen as the best guards of the protected area, and they may also play an important role in opposing the environmentally destructive development projects, such as dam construction or mining operations (Kothari *et al.* 1995; Orlove & Brush 1996). In many cases neither local communities nor state agencies can protect wildlife and its habitats alone, but they need each other's support in order to achieve successful protection results (Kothari *et al.* 1995). A local initiative for protection needs recognition from state legislators and environmental planners, whereas state conservation agencies need the co-operation of the local people in order to achieve sustainable conservation.

It is also important to note that many sites which are now under protection owe part of their biological richness or cultural landscape to the territory's long-established human activity, which has shaped the surrounding nature for centuries (cf. Gómez-Pompa & Kaus 1992). In forest-savannah transition zones the modifying human influence has in some cases even led to the improvement of soil quality and to the expansion of forest cover (cf. Fairhead & Leach 1994). In fact, it is often not relevant nor possible to define the "pristine nature areas" as something opposed to the "areas affected by human people", since during the course of time most of the areas have been more or less under human influence, and no truly "natural" areas exist (Fairhead & Leach 1994, 482; Gómez-Pompa & Kaus 1992, 273-274). Restricting the activities of the local communities, and thus reducing the modifying impact of human activities, has in some cases led to diminishing biodiversity in the area under protection (cf. Pimbert & Pretty 1997).

As the importance of the local people in nature protection has become better acknowledged by conservation agencies, new protected area management methods have been sought. Many alternative models of protected area zoning have been developed along with the traditional core area and buffer zone -model.

Figure 3 describes one of the new approaches to conceptualise the inhabited protected areas. There is no longer a specific core area, because the whole area is widely under human influence, and therefore there are no large intact areas. The question is then more on how to find the equilibrium between the human activities and the nature protection. The area is managed through certain limitations on the use of natural resources, as well as through environmental education campaigns and possible economic incentives for protection.

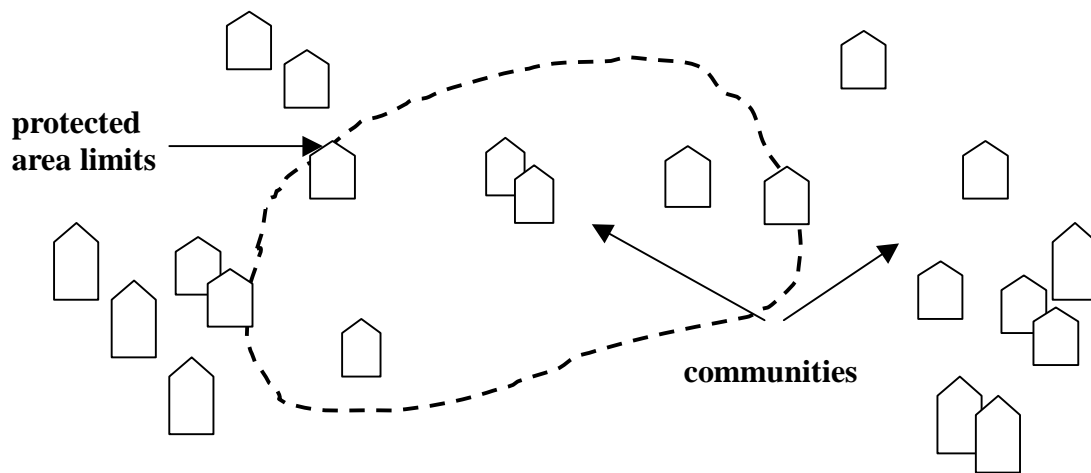


Figure 3. Inhabited protected area, where there is no clearly differentiated core area and buffer zone.

An important question in this situation is the distribution of costs and benefits of conservation activities. Wells & Brandon (1992) argue that the costs of conservation are the highest at the local level, lower but still significant at the regional and national levels and the lowest at the international level. On the contrary, the benefits are the highest at the international level, lower at the national/regional level and the lowest at the local level. For this reason, the rapid increase in the amount of protected areas has become a heavily contested topic in many parts of the world. As protected area management issues have become an integral part of the international environmental management (cf. Nygren 2000, Pimbert & Pretty 1997), representatives of the South have argued that when the initiative to establish protected areas in the South often comes from the

international policy-makers, the issue can become just another form of environmental imperialism practised by the North (Guha 1989, Fairhead & Leach 1994). The imperative to protect Southern forests is ultimately seen as Northern interest to gain economic benefits from Southern protection, such as mitigation of the climate change, genetic material for medicine and food, and ecotourism business run by foreign companies. The crucial question in this respect is who has the power to make decisions over the protected areas, and on which kind of values the decisions should be based upon. (Pimbert & Pretty 1997.) On one hand there is the question of local livelihoods in the South, on the other hand the environmental agendas of the Northern environmentalists and conservation agencies. These issues are often presented as two opposing extremes, although there are also attempts to find solutions in combining the two (cf. Gómez-Pompa & Kaus 1992; Pimbert & Pretty 1997). Some of the most fundamental issues in this discourse are local participation and sustainable development, which are the topics discussed in the following chapters.

2.4 Protected areas and participation

As previously described, the traditional protected area management was often characterised by coercion and control, in which local people were seen as an obstacle to conservation. Thereafter, the issue of participation has become one of the frequently referred issues in protected area management. For instance, the IV IUCN World Congress on National Parks and Protected Areas called for increased community participation and human equity in the decision-making of protected areas in order to improve their management (IUCN 1993, 19). Participatory approaches have also been a growing trend in the general public planning, as well as in the development co-operation (cf. e.g. *Guidelines...* 1997).

The term *participation* can be interpreted in very different ways, and therefore it is essential to define it carefully. Until the 1970s, the participation of local people in conservation was often seen as a tool to achieve the local approval to protected area plans, and participation was almost a mere public relations exercise. During the 1980s, participation of the local people was regarded as a mechanism to gain better results in natural resource protection, while in the 1990s, participation has

been interpreted more and more as a means to involve local people in protected area management. (Pimbert & Pretty 1997, 308.) In recent years, there has been a growing interest in the integrated management of protected areas, which means the ample participation of the local people in the decision-making and management of the area⁶ (cf. Ghimire & Pimbert 1997; Orlove & Brush 1996; Shyamshundar 1996; Wells & Brandon 1993). Pimbert & Pretty (1997, 309) classify the different levels of participation in protected area management as follows:

1	Passive participation
2	Participation in information giving
3	Participation by consultation
4	Participation for material incentives
5	Functional participation
6	Interactive participation
7	Self-mobilisation

In this table, *passive participation* means informing the stakeholders on what has happened in the area, or what is going to take place, while their reaction concerning the information or the activities realised are not taken into account. *Participation in information giving* means that information about the protected area is gathered from the local inhabitants through surveys, but people do not have the opportunity to influence the proceedings in the area. This way their role in the participation is only to give information. Discussing the results more widely, and people's *participation by consultation* in the definition of the problems and in the search for solutions of the management of the area is a step further in local participation. But even in this case they do not have an active role in decision-making, led by professionals. Sometimes participation means local *participation for material incentives* in which case local people provide some of their resources such as labour, land or collecting genetic material in return for food, cash and

⁶ A variety of terms, such as *co-management* or *community-based management* is used in the literature. The term *integrated management* is probably the best in the conditions of land ownership patterns among Central American mestizos. The land is usually not communally owned but based on a private ownership, and the local participation in protected areas management is ultimately subordinated to the authority of the state or other institutions. In many parts of Africa, and among many indigenous groups in Latin America, for instance, the term *community-based management* might be more appropriate.

other material incentives. In these cases, participation often finishes when the incentives end. (Ibid., 309.) However, compared to the first two levels, this kind of participation offers the local people a role as a subject, and not just an object of activities, as they both give and receive something from the protected area authorities.

According to Pimbert and Pretty, only the last three levels of participation (functional, interactive and self-mobilisation) are sufficient in order to achieve effective, efficient and sustainable conservation in protected areas. *Functional participation* is defined as people participating by forming groups to meet the predetermined objectives related to protection of the area. This kind of participation can also include the promotion of externally initiated social organisations. Even though these organisations are usually dependent on external facilitators, they may later become more independent. In *interactive participation* people formulate a joint analysis, which leads to action plans and to the formation of new local groups and the strengthening of the existing ones. These groups then take control over local decisions. Finally, self-mobilisation means people taking initiatives, independent of external institutions, to change the management systems of the natural resources. (Ibid., 309-310.)

Sustainable protected area management requires, first of all, understanding of the complex ecological and social relationships in rural areas, and valuing of local people's ideas and knowledge systems. Both the conservation authorities and the people living in and around protected areas have their particular strengths and limitations. For this reason, the advantages and skills of professionals need to be combined with the strengths of local people, this kind of participation process, at its best, leading to the real empowerment of the local people. (Ibid.)

2.5 Protected areas and rural development

The significance and role of protected areas in local and regional development has become one of the frequently discussed topics in protected area management. According to this view, protected areas can be an opportunity to combine

conservation and rural development (cf. e.g. García 1997, 51) and, by this way, to resolve the dilemma between nature protection *versus* local people's livelihood. It is important, however, to make it clear that the development in protected areas cannot be synonymised with whatever rural development. The special designation as a protected area needs to be taken into account, and the development activities carried out must be as environmentally sound as possible. In protected areas, if anywhere, development should mean *sustainable development*.

If the management actions are chosen by focusing on the socio-economic situation of the area, protected areas could, at their best, contribute to local development. The IV IUCN World Congress on National Parks and Protected Areas held in 1992 saw protected areas as an important tool in implementing sustainable development and discussed the various economic benefits protected areas can bring to surrounding areas. Protected areas have an important role in protecting watersheds, preventing soil erosion, mitigating the climate change and maintaining wild genetic resources for medicine or for plant and animal breeding, besides offering sites for tourism, research and education. (McNeely 1992.) The question is then how much these benefits profit the local communities, and not only the international investors.

There are many examples of the direct and indirect benefits of the protected areas to the local communities, such as increased yields and better nutrition through improved agricultural practices, or better health care and education possibilities through increased institutional attention to the area. The planning and management of protected areas can, in turn, benefit from the knowledge and experience of the local people. At best, protected areas can offer one alternative for the sustainable development of rural areas by encouraging the local economy in ecologically and socially sustainable ways (IUCN/CNPPA 1994, 22). For example, inhabitants of the nearby communities or in the area itself may find new alternatives for income generation from (eco)tourism and associated activities, or the communication possibilities in the buffer zone (roads, transportation, even telecommunication) may be improved as a result of the activities carried out in the protected area.

The problem is that the real benefits of protected areas are often not recognised, and that many of these benefits are outside the current concepts of economics (IUCN 1993). These include, for instance, fuelwood for home consumption, informal extraction of forest products, and recreation. Costa Rica has already a detailed legislation on the financial compensation for those landowners providing environmental services on their land (such as CO₂- fixation) (García 1997, 52) and landowners that protect forest areas in their properties can receive exemption from land taxes.

The sustainable management of protected areas must take the social, cultural, economic, and political context of the society into consideration (IUCN 1993). Unequal land tenure and resource distribution are some of the crucial problems in protected area management, which should be addressed in national and regional planning. At the same time, the protected area management should seek further tools in order to promote more local-based protection and conservation initiatives and to enable more socially and ecologically sustainable development in the area.

2.6 Lessons learned from past experiences

In recent years, a variety of different methods and managerial approaches have been examined in order to combine sustainable development and conservation, and to fulfil the needs of local people. These include economic incentives (such as ecotourism and small-scale use of the forest products), buffer zones around the protected area, the involvement of local and/or national non-governmental organisations in protected area management and attention to gender issues (cf. Dompka 1995; Ite 1996; Kothari *et al.* 1995; Orlove & Brush 1996; Parks... 1994; Wells & Brandon 1992). However, the results of different management experiments have been varying, and several cases of unwanted and unexpected results have also been reported (cf. e.g. Ite 1996; Kothari *et al.* 1995; Shyamshundar 1996). For instance, the promised rural development projects have often taken place slower and to a lesser extent than the local populations had expected, or the projects have not adequately responded to the needs of the inhabitants. The lack of local identification with protection has led to the passive

resistance against protection, to the encroachment of the protected areas and even to the physical violence against the conservation officials.

According to Pimbert and Pretty (1997, 313) there have been few attempts to adopt profound participatory planning methods in protected areas as yet. Similarly, Kothari *et al.* (1995) criticise many of the so-called "eco-development" projects by arguing that they are just a repetition of the old top-down thinking, and that the participation of local people is just a phrase in project proposals without any real knowledge on how to implement it. Therefore, the question of whose voice counts in decision-making is critical. Wells & Brandon (1992) point out that often the incentives offered do not link development and conservation together. People should benefit from development activities in such a way that there is a motivation for them to nature conservation.

One example of such an approach is El Angolo Hunting Reserve in Peru, where local ranchers and their labourers were offered an alternative employment through hiring some of the labourers as guides, wildlife consultants and camp assistants at the local university field research site in the protected area, while the ranchers received veterinary assistance to their animals from the researchers and other protected area personnel. The activities were co-financed by international donors. (West 1996, 45.) Similarly, a study realised in several protected areas in Botswana (Lebonetse 1996, 47) showed that illegal activities in the protected areas could be diminished through investing in the development of social services and alternative employment for local communities, instead of increased law enforcement and control. In many cases the protection results could be better if the local inhabitants were allowed to use the natural resources of the protected area, within sustainable limits.

In Colombia, conservation and educational stations were established in the Sierra Nevada de Santa Marta National Park to serve as models for sustainable development for rural farmers and indigenous people living in and around the Park. Moreover, a community reforestation programme was set up to improve the environmental conditions of the buffer zone, and a co-operative was organised in order to improve the marketing of the local products. A health post was

established in order to improve the quality of life of the inhabitants. As a result the local people have begun to change their agricultural practices according to the model by the conservation stations, and this has led to improved nutrition and income generation amongst the inhabitants. (Kemf 1996, 49.) In the National Park of Paria Peninsula, Venezuela, a community development project was initiated, including such elements as environmental education for the nearby communities, sustainable agricultural practices and alternative economic activities (honey production, ecotourism), when at the same time undertaking research on the ecology and ethno-zoology of the park (Ferreira *et al.* 1996, 61).

The following chapters analyse in a more detailed way the possible problems and solutions in the protected area management by examining the case study of the protected area of Miraflores in Nicaragua. The real challenge in Miraflores, as in so many other protected areas around the world, is how to combine the protection of nature with the productive activities of the local people who depend directly on the natural resources of the protected area for their well-being.

3 Nicaragua and Miraflores protected area

3.1 The socio-economic and environmental situation of Nicaragua

Nicaragua is situated on the isthmus of Central America. Its bordering countries are Costa Rica (south) and Honduras (north). In UNDP Human Development Report of 1999, the Human Development Index (HDI) ranking of Nicaragua was 121. of 174 countries (the list includes all UN member states). In Latin America and the Caribbean, only Haiti holds a lower HDI ranking. Problems such as extreme poverty, malnutrition and illiteracy are common, and the country is heavily indebted for international financial institutions. 75% of the Nicaraguan population are Mestizos and 6% are indigenous people, including Sumos, Miskitos and Ramas, and other ethnic minorities such as the Garifuna (Black Creoles). Most of these minorities live in the eastern lowlands and the Caribbean coast. (*Plan de acción...1994, 70.*) Population is heavily concentrated on the

western (Pacific-side) Nicaragua and on the capital city of Managua, which has approximately one million inhabitants. Population growth in Nicaragua is one of the highest in Latin America. Some central indicators of the general socio-economic situation of the country are presented in Table 1.



Figure 4. Map of Nicaragua (modified after CIA Handbook 1999).

Table 1. Country data on Nicaragua (UNDP 1999; *Plan de acción...1994*).

Estimated population	4,7 millions
Population density	34 habs/km ²
Official language	Spanish
Religion	90% catholic
Annual population growth rate	2,5%
Life expectancy at birth	68 years
People without access to safe water	38%
People without access to health services	30%
People without access to sanitation	65%
Population under income poverty line (1USD/day)	44%
Total net official development assistance, % of GNP	61%
GNP per capita	410 USD
Urban population	63,2%
Land area	120 349km ²
Forest, % of total land area	29%
Annual rate of deforestation	2,5%
Main exports	coffee, seafood, beef, sugar, cotton, bananas
Main domestic consumption	maize, beans, rice, sorghum, plantains, cassava

Nicaragua belongs to tropical climate zone. In general terms the dry season is from January to mid-May and the rainy season from mid-May to December, but in the eastern lowlands, near the Atlantic Ocean, the rainy season is practically all year round. In the eastern part of the country the mean temperature is +26°C and yearly precipitation 3800mm, whereas in the west the mean temperature is +27°C and precipitation 1700mm/year, with variations at higher altitudes.

Since the 1950s, the total forest cover of Nicaragua has been reduced from 7 million ha to an estimated 3,5 million ha in 1998 (UNDP 1999)⁷. In the 1960s and 1970s Nicaragua had the highest deforestation rates in Central America, approximately 100 000 ha/year.

⁷ However, according to Shi6n & Ambrogi (1997, 150) the figure was 6,2 million ha in 1995.

In the Pacific side of Nicaragua many *campesinos* (small-scale farmers) lost their lands to the extensive cotton and sugar cane plantations, and as a consequence they moved from the Pacific toward inland and towards the agricultural frontiers of the humid tropics where the land was not similarly apt for agriculture. These small-scale settlers practised slash-and-burn agriculture, clearing periodically new forest areas for cultivation. At the same time there was a significant increase in cattle raising by the *latifundistas* (large-scale landowners). The deforestation rate declined during the civil war in the 1980s, but increased again after the war, when the refugees, internally displaced people, and soldiers returned to agriculture. (Utting 1993, 10; Kaimowitz 1996, 10.) In recent years the annual deforestation rate has been approximately 87 000 ha/year (UNDP 1999)⁸.

The dry tropical forest has almost disappeared in Nicaragua, as it grows in the Pacific region with the highest population density. The lowlands in the Atlantic side are still rather sparsely populated and with little infrastructure, and it is in these areas where some large extensions of humid tropical forest can still be found. The expansion of the agricultural frontier has been one of the most important causes for deforestation. Land speculation and extensive cattle raising has caused large tracts of forest to be converted into pasture and farmland. Many small-scale farmers are obliged to practice agriculture on areas and soils that are not suitable for cultivation. Forests are also used for fuelwood, as approximately 1,8 million people utilise wood as their main source of household energy (Shi6n & Ambrogi 1997, 152). Reforestation programmes are not very widespread, therefore fuelwood and timber for construction are mainly extracted from primary forests and naturally regenerated secondary forests. Logging of tropical hardwood is a problem in the Atlantic forests, where large concessions have been given to transnational companies. The forest and land ownership rights have never been well defined in Nicaragua. Disputes over land ownership are common and the definition of property rights remains a serious problem in many parts of the country. (*Background...* 1997, 1-3; Shi6n & Ambrogi 1997, 159.)

⁸ Kaimowitz (1996, 9) lists estimations ranging from 70 000 ha/year to 125 000 ha/year in 1990.

Central American forests have rich biodiversity due to the region's role as an ecological bridge between North and South America. Therefore the loss of forest in the area is especially critical to the conservation of biological richness. (Kaimowitz 1996, 1.) In Nicaragua, the terrestrial vertebrates are relatively well known, containing approximately 1200 species. About 2% of them are endangered and 10% are threatened. At present an estimated 70%, or 7500, of the plant species are inventoried, among which 56 are endemic. (*Plan de acción...*1994, 48; Rueda 1999, personal communication.) The most important reason for the loss of biodiversity in Nicaragua is the expansion of agriculture. Illegal capture and trade of animals and plant species is also a growing problem. (*Informe sobre...* 1996, 17.)

3.2 Protected areas in Nicaragua

The first protected area of Nicaragua, the Wildlife Refuge of the Peninsula of Gosigüina, was established in 1958. By the year 1979 there were two more, and by 1990 a total number of 25 protected areas had been established. (*Informe Nacional...* 1997, 9.) Up to date Nicaragua's National System of Protected Areas (SINAP) includes 75 protected areas, classified in 9 different categories⁹ (*Naturaleza* 1999, 10). They cover 2,2 million hectares, equivalent to almost 17% of the total area of the country (see appendix I). This rates high in worldwide comparison, as only one third of all the countries in the world have more than 10% of their territory under the system of national protected areas (Green & Paine 1997, 12).

The executive agency for the protected areas of Nicaragua is the Ministry of Environment and Natural Resources, MARENA (*Ley General ...*1996, Article 22). However, there is no real national action plan for the conservation and management of the protected areas in Nicaragua, and therefore many of the areas are only "paper parks". (*Plan Operativo Global* 1998, 5.) Only 17 areas are under

⁹ These are, starting from the strictest protection category: Biological Reserve, National Park, National Monument, Historical Monument, Wildlife Refuge, Nature Reserve, Reserve of Genetic Resources, Protected Landscape/Seascape, and Biosphere Reserve.

some kind of active protection and/or management, and only 9 areas have management plans (*Naturaleza* 1999, 10). The existing personnel is under-equipped and lacks specialised training for protected area issues, such as legislation or management methods. The lack of institutional presence is a real problem in most of the protected areas, and there is still very little information of the general biophysical and socio-economic situation of each area, which makes it difficult to formulate national priorities for the protected areas (Villa Romero 1999). Ecotourism in Nicaragua is minimal and the first nation-wide plans for ecotourism in protected areas were being made when writing this study. In general, the protected areas in Nicaragua do not offer any infrastructure for the visitors, and only one area charges a small entrance fee. In neighbouring countries of Costa Rica and Honduras the entrance fees are common, and foreigners usually pay a sum that is considerably higher than that of national visitors. In Costa Rica tourism is the second most important source of income for the country (Barzetti 1993, 5).

Most of the lands in Nicaraguan protected areas are in the hands of private owners, which makes their management a rather challenging task. Only 4 areas are situated on state-owned lands, amongst them are Bosawas and Indio-Maíz, which are the biggest protected areas in Nicaragua. The situation is very different from many other countries in Latin America, such as Chile, Costa Rica or Cuba, where the land in protected areas is mostly or totally under state ownership (Acosta Blanco 1999; Villa Romero 1999). The Nicaraguan government does not have adequate funds to compensate the landowners in order to convert the established protected area into a state property. Even in the case that the state could buy the land, there remains a crucial question of where would the removed populations be settled. Furthermore, according to the current understanding of protected areas management worldwide it is not reasonable or even possible to establish the growing number of protected areas on state-owned lands only.

In this case, the protection results thus depend ultimately on private landowners' motivation and interest in conservation. Rodríguez (1998) states that this could be considered as an advantage as well, since people tend to take better care of

something that is their own than of something that is state-owned. According to the General Environmental Law of Nicaragua (*Ley General...* 1996)

"...national, regional and municipality planning must integrate environmental elements ... respecting transparency and citizen participation." (Article 12), "...the inhabitants of protected areas are their real guardians, having all those rights and guarantees that the State gives to Nicaraguans." (Article 19)¹⁰

In March 1999, a regulation of protected areas of Nicaragua was passed and introduced in the legislation (*Reglamento de áreas protegidas de Nicaragua* 1999). The new regulation gives the responsibility for MARENA to improve the participation of citizens in protected area management in order to achieve sustainable development (Article 5/2, Article 6/12). The possibility for co-management of protected areas with private institutes, local governments, NGOs, and universities and other scientific institutions is also highlighted (e.g. Article 3). Article 21 obliges the authorities to ensure the participation of local inhabitants when formulating the management plans of protected areas.

3.3 Miraflores and the Protected Areas Support Programme

The protected area of Miraflores¹¹ is situated in the north-western Nicaragua, in the Departments of Estelí and Jinotega. The protected area was established in 1996 and it was initially classified as a Nature Reserve (*Reserva Natural*). However, this category has recently been suggested to be changed into Protected Landscape (*Area Paisaje Terrestre Protegido*) basing on the more detailed information gathered about the ecological and social characteristics of the area (*Plan de acción...*1999). According to the categories of protected areas defined in *Reglamento de áreas protegidas de Nicaragua* (1999) a Nature Reserve is:

" Conserved or intervened land and/or coastal area, which contains interesting species of fauna and/or flora, and which generates environmental services of national and/or regional significance. The management objectives are to conserve and restore natural ecosystems and wildlife habitats that are reducing due to the degradation of their ecological

¹⁰ All the citations from Spanish have been translated by the researcher.

¹¹ Another protected area, the Nature Reserve of Mesas de Moropotente (7500 ha.) is just beside the Miraflores Reserve (5 675 ha). For most people in the area Miraflores means both Miraflores and Moropotente, and they both will be part of the management plan formulated by the PANIF-project. In this paper I thus refer to both areas with Miraflores.

environments; as well as to produce goods and services (such as water, timber, wildlife, recreation) in a sustainable way and according to the capacity of the area for the benefit of the local communities."¹² (Article 8/7.)

A Protected Landscape, is, instead, defined as follows:

*" A land area in which the interaction of human beings and nature has, during the years, produced an area characterised by certain cultural practices. It has important aesthetic, ecological and/or cultural values, and often hosts rich biodiversity. The protection, maintenance and evolution of this richness requires protection of the integrity of this traditional interaction. The management objectives of the area are to improve and protect the harmonious interaction between nature and culture, to conserve the associated landscape, habitats, species and ecosystems, to promote tourism and recreation, and to maintain the quality of the landscape"*¹³ (Article 8/8.)

Miraflor is now a pilot project under the *Protected Areas Support Programme* and its wider framework, *Environmental Co-operation Programme Nicaragua-Finland* (PANIF), both being part of the official Finnish development co-operation¹⁴ in Nicaragua. One of the aims of the project is to find appropriate management methods to be implemented in Miraflor, as well as in other protected areas in Nicaragua. The pilot project started in mid-1998. According to project plans the participation of local people will be given special emphasis. (*Plan operativo anual 1999; Plan operativo global 1998; Project document 1997.*)

Like in practically all protected areas in Nicaragua, the land in Miraflor is a private property, owned by large-scale landowners and small-scale farmers. Extensive cattle raising is practised within the area and in nearby zones. Before the PANIF-project there was no management plan or any demarcated boundaries concerning the protected area. (López & Rodríguez 1998.) Even the establishment degree of the Reserve (*Ley General...* 1996) did not define its boundaries, and there is no differentiated nuclear area or buffer zone in Miraflor. The PANIF-project will define the boundaries for the first time in the history of the Reserve.¹⁵ In addition to Miraflor, there are five other protected areas in the department of

¹² In IUCN categories this is equivalent to IV Habitat/Species management area (Article 9).

¹³ In IUCN categories this is equivalent to V Protected landscape (Article 9).

¹⁴ Operated by the Department for International Development Co-operation of the Ministry for Foreign Affairs of Finland.

¹⁵ The management plan was not yet finalised at the time of writing of this research, therefore no official map of Miraflor was available to be included here.

Estelí.¹⁶ In these areas the presence of MARENA is practically non-existing and the environmental degradation is a serious problem.

3.3.1 Physical characteristics

Miraflor is located at 28 km from the town of Estelí, centre of the Department and of Northern Nicaragua, with approximately 86 000 inhabitants (national census 1995), while the distance from the capital city of Managua is 185 km. Situated on the central highland of Nicaragua, the altitude in Miraflor varies between 500-1450 m (Valenzuela 1999a). The climate presents high variability due to the alteration in topography, and due to the altitude from sea level the climate is more temperate than in lower areas of the region. The two climatological zones present are tropical savannah and mountain subtropical. (Tekeleburg & van Eek 1998, 26.)

The area is clearly divided into the dry or lower zone (the former) and the humid or higher zone (the latter). The yearly mean precipitation varies according to the place from 800 mm to 2000 mm, the dry season lasting from November to May, and the rainy season from May to October (Valenzuela 1999a, 3, 9). The yearly mean temperature is approximately +21°C. Miraflor serves as an important watershed area for the town of Estelí as it is situated by the banks of Río Estelí.

Miraflor consists of three distinct types of ecosystems: dry deciduous forest, tropical oak and coniferous forest, and humid tropical cloud forest (Tekelenburg & van Eek 1998, 45). According to the oral history, Miraflor (literally translated *look at the flowers*) got its name due to the abundance of flowers once growing in the area. Nowadays the remaining primary forest patches are relatively small, and especially the dry zone is largely deforested. Roughly 40 % of the total area is forested, but primary forest covers approximately only 10 % of the total land area (TROPISSEC 1998, in Valenzuela 1999a, 14), the rest of the area is under agricultural activities and pasture. The variety and amount of fauna in Miraflor

¹⁶ The other protected areas of the Department of Estelí are Cerro Tomabú, Cerro Quiabuc-Las Brisas, Cerro Tisey-Estanzuela, Tepesomoto-Pataste and Mesas de Moropotente, which altogether cover 27 080 ha.

has declined considerably during the past decades. The Reserve hosts few endangered species, like the resplendent quetzal (*Pharomachrus mocinno*, a colourful tropical bird) and some orchids.



Figure 5. Landscape in the dry zone.



Figure 6. A forest patch in the humid zone of Miraflores.

3.3.2 Socio-economic characteristics

Approximately 4800 inhabitants, mostly Mestizos, live in Miraflores, scattered in 942 households in 39 small communities and in few more densely populated settlements (*asentamientos*)¹⁷. There is an average of 27 inhabitants/ha. (Valenzuela 1999b, 5.) According to the survey made by UCA-Miraflores in 1996, 85 % of the population is less than 35 years old. Women traditionally take care of the children and of the household duties, while their participation in agricultural activities is often limited to small husbandry and fuelwood gathering.



Figure 7. Children of a local school in Miraflores.

There are two producer organisations, UCA-Miraflores and APROAMI, in Miraflores, competing for power with each other. The former is a co-operative associated with left-oriented Sandinists and the latter consists mostly of medium-scale and some large-scale landowners. UCA-Miraflores brings together 12 co-operatives, and it has

¹⁷ Some of these communities will probably be left out from the protected area once the final boundaries of the area will be demarcated in the management plan of Miraflores (cf. *Plan de acción...* 1999, 11-12).

more than 300 small-scale producers as its members. It gets its financing mostly from Dutch and German NGOs. Since its formation in 1990, UCA-Miraflor has had a special commission of natural resources and environment. It consists of 67 members, who are also known as voluntary forest guards. Other recent sub-groups of UCA-Miraflor include *Mujeres Organizadas* (Organised Women) and *Jovenes Ambientalistas* (Young Environmentalists). These groups organise work-shops, training and other activities on topics such as agricultural diversification and environmental education. The latest sub-group, Young Environmentalists, was founded at the beginning of 1999.

APROAMI (*Asociación de Productores Ambientalistas de Miraflor*; Association of the Environmental Producers of Miraflor) was founded in 1998, when a group of not-organised producers recognised the need to have a body that would represent their interests in issues concerning the protected area and its management. Consequently, the organisation took the word "environmental" in its name. According to its objectives, APROAMI aims to develop alternative income generation strategies that are in harmony with the sustainable use of local natural resources. It also aims to promote wide participation of the communities and local institutions in the decision-making, as well as to contribute to the protection of the ecosystems of Miraflor. By May 1999, APROAMI had 64 members. It has become an active participant in negotiations with PANIF, and especially in the development of eco-tourism in the area (cf. López & Rodríguez 1998).

Land ownership in Miraflor follows the general pattern in Nicaragua. Ever since its independence in 1838 most of the land in Nicaragua was in the hands of big landowners (*latifundistas*). The unequal distribution of land and other productive resources was one of the main reasons that led to the Sandinist revolution against the rule of the dictator Anastasio Somoza in 1979. Before the revolution land in Miraflor was owned by few *latifundistas*. They mostly cultivated coffee and practised cattle raising, which had led to a partial removal of the forest cover. However, most of the area was still forested. The amount of population was small, consisting of few families who worked for the large landowners and cultivated their own small plots.

During the agrarian reform of the Sandinist government in 1980-1989, many large farms were confiscated throughout Nicaragua and assigned to co-operatives, smallholders and landless people. In Mirafior, 21 co-operatives were organised. During the civil war the biggest population settlements (*asentamientos*) of Mirafior, Puertas Azules and El Cebollal, were created in order to protect the inhabitants from US-backed Counter-revolutionary (Contra) attacks. Mirafior was one of main battle scenes during the wartime due to its vicinity to the Honduran border. In order to increase food-production the co-operatives shifted from coffee to potato cultivation and cattle raising, which led to rapid removal of the forest cover and widespread use of agrochemicals. Besides producing food, the potato fields offered less possible hiding places for the Contras than the coffee fields, and the *campesinos* working on the fields were at the same time vigilating the area. For governmental purposes to defend the region, people from other areas of Estelí and Nicaragua were moved to Mirafior to join the co-operatives.

The civil war in Nicaragua lasted from 1979 to 1990, and armed paramilitary groups operated in Mirafior even thereafter. The war left the community strongly divided into two oppositions, namely the small-scale farmers as Sandinists and the large-scale farmers as Liberals (ex-Contras). Resentment on both sides complicates co-operation for common objectives, such as the protection of the environment. The past and present environmental problems are often seen to be caused by the opposing group, as can be seen in the following citations by Ana Gloria, an active *campesina*, and by Maria Fernanda, a well-educated and powerful large-scale landowner¹⁸:

"...the way of the rich people here - there wouldn't be any more nature left if it would be for them, because of what they do, what they have destroyed... For instance if they deforest, they do it in large-scale, it doesn't matter them, they can bring machines, they have all the facilities, compared to the..."

"...if they are interested in conserving the environment, why was it then them who were the first ones to destroy? These farms were confiscated from their owners. And when they fell on the hands of the co-operatives.... because of the cultivation of potatoes, all was destroyed.... Now there is not the shade of the trees as it used to be here in Mirafior."

¹⁸ All names of the informants have been changed to pseudonyms. The translations from Spanish are made by the researcher. They do not intend to offer a literal translation of the interviews.

Of course, there are also influential members on both sides who want to let bygones be bygones and struggle for uniting forces for the protection of Mirafior. Eugenio, one of the voluntary forest guards, emphasised the importance of reconciliation for the future of the area:

"The war ended only a little time ago, and there are some quarrels between the two opposite sides of the war, between the rich and the poor. And I was one of them. But now I'm not, I know it's time to make the peace, to work for the zone, to carry out all these plans, to protect the environment, and to make Mirafior a beautiful place. First we have to become conscious, both them and us, so that we can live in harmony."

After the 1990 elections, when the rule was shift to the Liberals, the government returned many of the confiscated lands to the previous owners and dissolved the co-operatives. A part of the co-operative lands was divided into small properties and given to *campesinos* that were co-operative members. After the dissolution of the co-operatives, Mirafior consisted of small-scale farms, and some large-scale-farms and remaining co-operatives. In this period, vegetable cultivation was introduced in Mirafior, while some of the producers returned to the cultivation of coffee. (López *et al.* 1999, 14.) Many of the properties formed in the beginning of the 1990s still do not have a legal land title, because according to the earlier legislation the lands of the co-operatives could not be divided. Moreover, the Regulation of protected areas of Nicaragua, published in March 1999, prohibits land titling within the protected areas (*Reglamento de áreas...* 1999, Article 59).

In recent years an increasing number of *campesinos* and the remaining co-operatives all over Nicaragua have sold their land to large landowners. This is mainly due to the limited economical possibilities and uncertainty on land ownership. In 1998, the co-operatives in Nicaragua owned only 21% of the land they owned in 1990, at the same time the number of co-operatives has declined by 51%. In many of the still existing co-operatives each member owns a piece of land and the co-operative is only for credits and other services. (A study made by Grupo Propositivo de Cabildeo, 1998, in *El Nuevo Diario*, 13.04.1999.) Similarly in Mirafior, many middle- and large-scale landowners have increased their properties in the past few years, by buying land from the small-scale producers. Many of these *campesinos* continue to work on the land after selling it by working as *a mediados*, which means an arrangement between the landowner and the

worker where the landowner provides seeds, plants and tools, and the worker provides his labour. The harvest is divided 50-50.

The small-scale producers of Miraflores cultivate beans, maize, potato, cabbage, tomato, coffee, and in some cases also broccoli, cauliflower and carrots. The variety in cultivation is fairly limited, for instance there are very little fruit trees or home gardens in the area. Malnutrition is common amongst the poorest segments of population. The commercialisation of the products takes place mostly through middlemen and hierarchical trading networks, leaving little benefit for the *campesinos*. Extensive cattle raising is practised by medium- and large-scale land owners. The biggest farms have 700 *manzanas*, whereas the smallest farms consist only of 1 *manzana*. There are many people without any own land and these people live in conditions of extreme poverty. Especially in the humid zone of Miraflores, many people work as *peons* (paid labourers) for the bigger landowners, while they themselves possess only a small land area dedicated to the cultivation of basic crops for subsistence. In the dry zone, the inhabitants are mostly working on their own mid-size farms. The owners of the large-scale farms in both zones live in Estelí and visit their farms a few times a week.

The price of the land in the humid zone of Miraflores has risen sharply in the past few years; in May 1999 one *manzana* could cost as much as 1200 USD. According to my interviewees this is due to the high productive potentiality of the land in the humid zone, as well as due to the scarcity of equally fertile land in other parts of central highland of Nicaragua, because of soil erosion¹⁹. Probably, the rise is also due to the special position of Miraflores as a pilot project amongst Nicaraguan protected areas. PANIF and other projects are expected to bring financing possibilities, infrastructure and media attention to the area, therefore land-speculators step in to the scene. Furthermore, the roads in Miraflores, even if dirt roads, are in much better condition than in many other villages in the region. Therefore, it is attractive to invest in land there, since the products can be transported to markets even during the rainy season. However, as the land prices

¹⁹ Ultimately, the causes of the scarcity of fertile land are the unequal land tenure and the relatively high percentage of population working in the agricultural sector.

are relatively high in Mirafior, it is questionable whether those who can still afford to buy the land in Mirafior will accept any kind of land-use restrictions for protection purposes, after investing so much in their farm-site.

The services offered by the state and by the municipality in Mirafior reflect the general situation in Nicaraguan rural areas. There are 23 primary schools and one secondary school, constructed by UCA-Mirafior, which offers classes also to adults on Saturdays. Most of the primary schools offer only the first four grades, and only four schools have complete six grades. Approximately 35% of the inhabitants are illiterate. (Valenzuela 1999b, 8.) Only 8 communities have running water and in other parts household water is taken from streams and ponds. The lack of water is a serious problem in the dry zone of Mirafior, where water from the rainy season has to be conserved in artificial ponds for the rest of the year. Just one community in Mirafior, El Coyolito, has electricity, but only few families have access to this service. Another community, Puertas Azules, has electricity operating through a small generator, even though most of the time the generator is not functioning due to disputes over who should contribute to buy the needed gasoline. Puertas Azules and El Coyolito have health posts run by a nurse and occasionally visited by a physician. For most health problems the inhabitants must travel to Estelí. There is a daily bus service to Estelí and Yali, but during the rainy season the dirt roads get so deteriorated that the buses often can not circulate. There are also many communities situated far from any roads.

The next chapter explains how the material, on which this analysis of Mirafior is based upon, was gathered and interpreted. In chapter 5, the intentions of protecting the Mirafior area will be analysed in the light of diverse opinions and perceptions. At the same time, the study will examine the future challenges and alternatives of the management of the Mirafior protected area.

4 Material and methods

4.1 Fieldwork in Miraflores

This research is mainly based on qualitative research methods, such as thematic interviews, participant observation and analysis of the project documents, statistics and law texts. I preferred qualitative methods since my research problems are explorative and qualitative. In the situation where relatively little information of the local people's opinions of the protected area was available, the analysis about *how* Miraflores and its protection was perceived by the local people, and what was their relationship to the protected area management was seen as a very relevant research question. In this context, it was more important to get a qualitative and a more integral view of the situation than to quantitatively survey, *how many* representatives of specific opinions, for instance, there would be.

In order to get information of the needs and opinions of different actors in Miraflores, I realised 15 thematic interviews with various members of different interest groups in the region. These interest groups were first identified on the basis of various Miraflores project documents, preliminary interviews with different persons and discussions with the project personnel. As a result, the main interest groups that were interviewed consisted of:

- APROAMI
- UCA-Miraflores
- *Mujeres Organizadas* (Organised Women, part of UCA-Miraflores)
- *Jovenes Ambientalistas* (Young Environmentalists, similarly part of UCA-Miraflores)
- MARENA delegation in Estelí
- voluntary forest guards

In addition, various interviews were realised with non-organised local producers (large-scale and small-scale), because not all the inhabitants belong to an organised interest group.

I tried to carefully select the representatives and/or key persons of each group to my interviews. 11 of the interviewees were men and 4 women, 12 were Nicaraguans and 3 foreigners resident in Nicaragua. The language used in the

interviews was Spanish, and in one case English. Some of the themes were similar in all the interviews, but there were also some topics specific for each interview, since the different interest groups had different sphere of activities. The key themes of the interviews consisted of the following issues:

- socio-economical position and social history of the informant
- agricultural activities and livelihood strategies
- history of Miraflor
- environmental and development problems of Miraflor
- knowledge on the protected area
- decision-making processes in regard to protected area
- opinions on environmental regulation in Miraflor
- pros and cons of protection
- vision of the future of the area

In order to increase the validity (cf. Yin 1994, 95; Grönfors 1982, 175-176) of the research, relevant material was gathered from other sources as well. These included direct observation, participation in 11 meetings and workshops in Miraflor and Estelí (see appendix II) and visits to several communities in Miraflor. Moreover, the review of the documents and studies produced on the area by the PANIF-project, and the discussions with the project personnel were valuable sources of information. The fieldwork in Nicaragua was carried out in April 6th – June 29th 1999.

Before the final analysis each interview was transcribed and numbered. At the first stage the transcribed material was read thoroughly in order to get a general understanding of the contents. At the second stage, the analysis was carried out more systematically, by commenting along the lines and pointing out interesting parts of the text. Themes identified in this way were then arranged together in different categories. Similarities and contradictions were searched for and the material of the interviews was compared to the material gathered through observation and documentation. Yin (1994, 109-115) calls this method as pattern matching.

4.2 The researcher as a part of the research process

Gathering of material in Miraflores was a great learning experience, which also means that if faced with the same situation at present, I would do many things differently. Due to my little experience in conducting interviews I could not always go so in-depth with my informants as I had aimed, and when transcribing the interviews I often realised how some clarifying or interesting questions had been left with little attention.

I am aware that this study presents only one interpretation of the situation in Miraflores. The opinions could have been different for instance, if other representatives of the interest groups were interviewed, as the groups were fairly heterogeneous. However, I spent a couple of weeks in the area before starting the interviews, in order to get a considerably good idea on whom to interview of each group. I simply could not interview everybody, so I had to choose persons whom I considered to be able to give me relevant information and important points of view. As this research is qualitative, my aim was not to have a representative sample of all the possible interviewees like in many quantitative surveys, but to gather different opinions from different sources in order to get a more holistic view of the situation in Miraflores.

The whole research was like a process, of which I as a researcher, was an integral part. According to current conceptualisations of qualitative methodology, the researcher can not be a neutral outsider observer, but his/her scientific, social and personal positions have a certain influence to the research process. In my case, it is important to note that I came from a Northern country and could never be one of the local people. Furthermore, this was my first time in Nicaragua, even though I had earlier stayed for more than one year in the neighbouring country of Honduras. However, the fact that I was an outsider also had a positive influence to the research. I could discuss many topics that my interviewees perhaps would not have discussed the same way with someone from the same society due to political and social constraints.

It is important to note that the informants gave me information that they considered to be relevant and important to tell to an "outside" researcher. Especially when interviewing the key-persons of the organisations, I often noticed that they were also negotiating with me. For this reason, I also selected such kind of informants who were critical towards their organisation; this in order to understand even the conflicting and controversial issues. It was not always possible to have the interview alone with the informant; there were often other members of the community or of the organisation present, sometimes adding their own comments; all of which gave me some valuable information of the complexity of the opinions. When interviewing local women I did my best to realise the interview at a moment when her husband was not present, as I had fear that otherwise it would easily be the husband talking and the wife just listening as a bystander.

I carried out my fieldwork with close co-operation with the Finnish environmental co-operation project (PANIF), although I was not part of the project staff. Even though the project will receive this thesis as my final report, I chose my research aim independently. This position helped me to remain open for criticism towards the project although it also caused that I probably represented the PANIF-project or the institution of MARENA for some of the informants, and was therefore provided of information that the interviewees considered these institutions would like to or should know. For some informants it seemed difficult to talk with a young female researcher from the North, and sometimes I did not understand their viewpoints correctly because of cultural and language barriers. Some of my interviewees were very well aware that I was doing my thesis, and that their words would be carefully analysed, thus calculating their arguments cautiously. In this situation, I tried to gather material from different sources and by different methods, such as documentation and participant observation, in order to get a more broad insight on the situation

The PANIF-project became more visible in Miraflor during the time I was gathering my field material, and with all probability the results would have been somewhat different if the material had been gathered in a different time-sphere of the project. During the course of time the project and its aims will become more

concrete and clearer to the local people, and they will be able to assess more carefully what the protection of the area implies to them. It is important to remember that the following analysis presents the situation in the light of the material gathered in conditions of spring 1999.

5 Protecting Miraflor - why and how? ²⁰

5.1 How did Miraflor become a protected area?

Practically all the official and unofficial documents I found on the establishment of the Miraflor protected area emphasised that Miraflor was declared protected area due to an initiative taken by the local population. For instance, the official brochure of MARENA on Miraflor states:

"...Miraflor was declared protected area as a response to the initiative taken by the 5000 inhabitants of the zone."

In reality, it seems that the whole process was an initiative by UCA-Miraflor. In March 1993, UCA-Miraflor organised "The First Environmental Meeting of Miraflor" (UCA-Miraflor 1993). Its participants, 20 UCA-Miraflor members as representatives of the communities, and 20 representatives from different institutions and organisations, identified the environmental problems in Miraflor and tried to find their solutions. One suggestion made in this meeting was to make a proposal of declaring Miraflor as a protected area. It was, therefore, actually this group of 20 selected UCA-Miraflor- members who took the initiative, not the population as a whole. UCA-Miraflor has a dominant position in the area, and it seems that their version of the establishment of the protected area has become the official interpretation. Of course it would have been difficult to get the opinion of all the 5000 inhabitants about the establishment of the protected area, but definitely not all of the sub-groups were even represented. This explains why

²⁰ The information presented in this chapter is gathered from observation, interviews and discussions with various people in Miraflor/Estelí, unless otherwise stated.

some large-scale landowners do not easily accept the idea of a protected area, since they consider it to be "UCA-Miraflor's non-sense".

In fact, even the members of the UCA-Miraflor themselves often stressed that the establishment of the protected area was their idea and that the territory belongs to their management, all of which contradicts with the slogan "initiative taken by all the inhabitants" widely promoted in their documents. All this shows how the members of an organisation often reinterpret their past achievements in order to fit better to a changed situation in which new, competitive actors, such as APROAMI and MARENA in this case, step into the scene. Nicaragua is currently ruled by a right-wing Liberal government, and usually the majority of the state officials are selected amongst the advocates of the ruling party. In this situation, it seems that UCA-Miraflor has fear that the increased presence of MARENA in the area means less possibilities and power for them as a Sandinist group and a co-operative organisation, and more privileges for those in favour of the governmental policies.

Besides the noble arguments of "environmentalism" often put forward by the representatives of the local organisations of Miraflor, motivations to support a protected area may also be self-interested or opportunistic. There is much competition for obtaining funding between the different organisations, and the promotion of environmental issues may offer increased possibilities for financing. This can be remarked in the following comment by Raul, one of the outsiders who owns land in Miraflor:

"Well, you know, there are many issues in fashion, for example working with street-children, with women, and these things get money from outside. So protected area brings money for an organisation. ...if I wanted to get money from outside I'd look for a matter that's in fashion. And then I would try to convince people - yeah, you have to plan for it. It's one way to work."

Even the above mentioned MARENA's brochure on Miraflor describes the situation in a way which seems to serve the vested interests in the area. The rhetoric of the brochure certainly attracts international donors, but it seems to have little in common with the reality. After visiting the area it becomes hard to believe that

"...the majority of Miraflores inhabitants are involved in the cultivation of vegetables, organic coffee and exotic flowers, and cattle raising. These communities are aware of that they need the forests to maintain the adequate soil and climate for their cultivations. The inhabitants have made great effort in sustaining themselves without disturbing the fragile ecological equilibrium of the area, thanks to their emphasis on conservation and their active role in the management of the Reserve."

In the current situation, where many practices commonly carried out in the area cause the increasing environmental deterioration, it is clear that the citation does not reflect the reality of Miraflores. However, this is not to deny that such a portrayal of the region could not be true in the long-term, if the use of natural resources changes towards more sustainable practices.

5.2 Practices degrading the environment

Human interventions have had great impact in the ecosystems of Miraflores. Primary forest patches are left practically only at the humid zone, elsewhere the forest has mostly been cleared for vegetable or basic crop cultivation, for pastureland or in search for fuelwood. The majority of the dry zone in Miraflores is now under cattle raising. In the humid part, there are some coffee cultivation areas that have traditionally trees for shading the coffee plants.

Agrochemicals are widely used in all kinds of cultivation. Whereas the pests and plant diseases are a great problem in the tropics, the excessive use of artificial substances should be diminished, which is not the case in Miraflores at the moment. Theodoro, one of my informants who uses agrochemicals extensively, reflected the matter as follows:

" The first thing is to have a sound soil. And then the right fertiliser. The most advisable would be analysis of the soil. But not here... like a bad physician, we give a little bit of everything to see what works for the illness. We apply this and this and this... There are insecticides, the strongest that exist. Preventives, or curatives, which is more expensive. Fungicides. Yes, yes. It is very humid here."

At worst cases people apply fertilisers, herbicides, fungicides (preventives and curatives), defoliant and insecticides all at the same field, in many cases using

products which are prohibited in the North. Even the poorest *campesinos* commonly use agrochemicals, even though the products are expensive. In addition, most of the farmers do not use any protection equipment when applying the chemicals and some people told that they have had health problems due to their use. The empty agrochemical containers are sometimes used to store drinking water or food. Often the products are applied without knowledge of the proper doses; there is a risk that the pests develop resistance to the products, and later ever bigger doses must be used. (Torres 1999, personal communication.) Most of the producers continue to use the products due to customs and lack of knowledge of other options. During the Sandinist government the state subsidised the prices of agrochemicals, and many development projects promoted their use, as commented by Eugenio, one of the voluntary forest guards who himself experiments organic farming:

"...people were educated to manage (their fields) only with agrochemicals."



Figure 8. A potato field before harvest. The field is treated with Gramoxón, a herbicide prohibited in many countries of the North.

The potato yields were high during the first years of the introduction of potato cultivation to the area in the 80s, but soon thereafter different plant diseases and pests began to reduce the yield, and currently potatoes can be cultivated in Miraflores only with heavy use of agrochemicals. Even the people who in public praised organic farming told me afterwards that, in the end, it is impossible to leave using the chemicals within vast majority of the crops. Some products, such as widely blamed potatoes, are probably not ecologically adapt to areas like Miraflores. The use of agrochemicals can have serious long-term effects on the inhabitants and the ecosystem²¹, and therefore other options, even if not totally organic, should be carefully studied.

At the moment, the farmers feel that organic farming requires much more labour and that there is no security on the amount of harvests, thus they prefer to invest in agrochemicals. The price for the producer of organic products is in most cases the same than that of normal products, while the production costs of organic coffee, for instance, are estimated to be 20 % higher than in normal coffee, and at the same time the yields are smaller (*Documento de avance...1999*, 20). Therefore it is not an attractive option for a producer, if there is no guarantee for a better price. The concept of organic products is not very widespread in Nicaragua, and there is no national certification system for them, as there is little national demand for organic products at present. The majority of the consumers in Nicaragua have to buy products according to their limited economical possibilities regardless of health preoccupations. However, some producers in Miraflores have organic coffee farms, which have obtained an official certificate from an US-based company. Practically all of this certified coffee goes to exportation through the certifying company, and the price paid for a producer is approximately 30 % higher than at the national market. The reason why more coffee-producers in Miraflores have not taken advantage of this option may rest in the widespread view of the low returns and high labour requirements of the organic products. Moreover, one farmer producing certified coffee described how it had taken several years before the coffee he had planted in old potato fields could be accepted as organic, since the soil was so saturated with residues of the previously used agrochemicals.

²¹ To my knowledge no comprehensive data of Miraflores exists on the topic.



Figure 9. An organic coffee farm.

Another practice affecting the quality of the soil and plant regeneration in Miraflores is the cyclically repeated fires realised for agricultural ends. The burning of vegetation before planting or before moving cattle to new pastureland in the end of dry season still takes place in Miraflores, although people told that there are considerably less fires than a few years ago. Most of them stated that this is due to the increased control in the protected area, and to the increased awareness of the damages caused by the extensive burning. The burning of the fields reduced considerably also nation-wide, from 273 000 ha in 1990 to 25 000 ha in 1995, due to national campaigns against burning (Shi6n & Ambrogi 1997, 151). There was a severe problem of forest fires and smoke in whole Central America at the end of the dry season in 1998. The burning was extremely extensive and uncontrollable

fires caused serious damage to cultivations and cattle around the region. This lesson probably caused that there were only a few fires in Miraflor in 1999. According to the farmers burning is often the only possibility to establish good pasture, and to control viruses and insects which harm cultivations and cattle. Even the Forestry Regulation brings it up as one agricultural practice (*Reglamento forestal* 1993, Article 7). On the other hand, the Regulation of protected areas of Nicaragua (*Reglamento de áreas...*1999, Article 88) defines the unauthorised use of fire in protected areas as a very serious violation against the law.

Most of the people in Miraflor seem to agree that the burning of the land should be done in a more controlled way, e.g. not burning every year and by clearing safety circles around the area to be burned in order to avoid the unwanted spreading of the fire. Some people stated that fire control is good, because at the time of the most extensive fires even domestic animals were burned by accident, as well as those forest areas that were intended to some other purposes, such as for fuelwood, construction material, or maintaining it as a reserve for future needs. However, even if controlled, the use of fire hampers the natural regeneration and kills many micro-organisms in the soil.

In some areas of Miraflor soil erosion causes problems, as the removal of vegetation cover has exposed soils to water and wind erosion. Large tracts of forest have been felled for pastureland, as cattle raising practices are predominantly based on extensive rather than intensive land use strategies. The most commonly used pasture is natural grassland, which implies that relatively large pasture areas are needed to raise the small numbers of cattle. Moreover, cultivations and especially the pasturelands have been in several cases extended to slopes with more than 30% gradients. The hurricane Mitch, which hit the Central American region in November 1998, evidenced clearly the tendency to erosion, while causing significant damage in Miraflor, as elsewhere in the area.



Figure 10. Pasture area after burning.



Figure 11. Land cleared for pasture in the humid zone of Miraflores.

In the majority of the households, cooking and heating are based on the use of fuelwood, which is gathered from the remaining forest patches. Shi6n & Ambrogi (1997, 152) estimate that in the Central Region of Nicaragua the average use of fuelwood per person is 2,6 kg/day. Previously fuelwood was extracted and sold to consumers in Estel6, but now this is prohibited. There is a heated debate over how much fuelwood those landowners living in Estel6 but owning land in Miraflor are allowed to gather for their use in Estel6. Wood is also needed as signposts for fences, as old posts have to be replaced every four or five years. There have been some initiatives to promote the use of living fences of such species that regenerate easily, but the farmers are not very eager to use this system, because according to them living trees destroy the barbwire.

There are no deposits for garbage in Miraflor, nor any kind of waste collection system. The most common procedure is to burn all the waste, from plastic to batteries. Few families, mostly those participating actively in UCA-Miraflor training courses, are experimenting composting. The majority of the households do not have latrines, therefore there is a great risk of the contamination of the water sources. Even the water-post at the health centre in Puertas Azules was found to contain significant amounts of *E. coli*.

5.3 Management of the Miraflor Nature Reserve

At the Environmental Meeting of 1993 the original Natural Resources Commission of UCA-Miraflor was expanded to have members from several communities within the area. The meeting decided to set a permanent prohibition for deforestation, extraction of fuelwood and hunting within the Miraflor area. The commissioners were authorised to give a follow-up to these decisions in their respective communities. (UCA-Miraflor 1993.)

Later, the commission members became known as voluntary forest guards, and the then delegate of MARENA in Estel6 acknowledged their avail in the protection of Miraflor. In practice this meant that they would carry out inspections to check if a particular tree could be utilised or not, and the technician of MARENA would then

either accept or refuse the official permission based on the voluntary forest guard's inspection. As a part of MARENA's management strategy, the landowners have been granted a permission to cut down a limited amount of trees in exchange of setting up a sign with a message of promoting the protected area management in their property, such as "*Protected area – Prohibited to hunt. MARENA – UCA-Miraflor*", "*Miraflor Natural Reserve – Let's protect natural resources*", or even "*God gave the nature to us – Let's protect and take care of it*". Some of the signs have been burned down, apparently as a protest from the landowners toward this kind of imposed protection rhetoric (Gómez 1999, personal communication).



Figure 12. A sign with a message on the protected area.

Little by little the "patrolling" by the voluntary forest guards became a more concrete grass-root level environmental education for the people of Miraflor. Surprisingly, even people from opposing political groups gradually acknowledged the work of the voluntary forest guards. Maria Fernanda, one of the few large-scale

landowners who remained in the area even during the Sandinist time, praised the work of the voluntary forest guards in the following way:

"...another thing that seems good to me is that there are voluntary forest guards, and this in my opinion has perhaps stopped the burning a bit, since they are there in the community, so they more or less vigilate who started the fire, or who is cutting trees, or who is taking fuelwood."

In 1995, UCA-Miraflor obtained a 3-year funding from a German-based NGO for hiring a full-time MARENA technician to work in the area²². The technician became a well-known figure in Miraflor (the inhabitants commonly use Marena as his last name) and he managed to limit some of the most destructive practices. During his period, Miraflor was also officially declared as a protected area. After the contract was over, the technician became the MARENA co-ordinator of all the protected areas in the department. This caused resentment in UCA-Miraflor, as they had considered him to be "one of the people of UCA" who had now moved to the other, opposing, side.

In 1998, MARENA hired two new permanent technicians to the area, one of them again with the similar kind of agreement with UCA-Miraflor. These technicians circulate in the area the as much as they can, but obviously it is not possible to do much with only one motorcycle at their disposition. In 1999, the construction of two fire-surveillance towers was initiated, and the aim was to set up two general checking-points along the roads leading out of Miraflor. There is one police station in Miraflor, and the co-operation with the police in the environmental vigilance of the area was strengthened through an official agreement made with MARENA and the police forces.

Within the framework of the PANIF-programme, Miraflor is finally going to have a management plan. In May and June 1999, two workshops were held in the community of El Cebollal in Miraflor with the aim of elaborating the management plan of the protected area through participative methods. Approximately 60 people were invited to attend the meetings, representing different communities and

²² UCA deposited the grant on the account of MARENA, which then paid the salary of the technician. The technician was therefore under MARENA's administration, but naturally with close ties to UCA.

organisations working in the area. In practice, the participation of the inhabitants and landowners of Miraflores in these meetings seemed to be what Pimbert and Pretty (1997, 309) call as participation in information giving and participation by consultation (see chapter 2.4). No representatives of the biggest landowners attended the first workshop, in which the topic "problems in the use of natural resources in Miraflores" was dealt with. The majority of the invitees were UCA-Miraflores members, and only a handful of women participated, none of them representing the communities, but only the organisations and institutions working in the region. The methods used in the workshops were rather complex, with a difficult terminology. In this situation, the equal and interactive participation between a well-educated large-scale landowner and an average semi-illiterate community representative can be questioned.



Figure 13. Participants of the first workshop on the management plan of the area.

In any case, the workshops meant the beginning of a very extraordinary process in the region. For the first time representatives of the opposing parties were discussing the possibilities of sharing some common aims. The second workshop, in which the possible solutions and those responsible to carry them out were

planned, saw the active participation of several large landowners. Augusto, one of the key-figures in a producer organisation commented the event afterwards:

"This has been really good. I think that without these workshops we would never have taken the initiative to sit down to discuss these things together and to listen each others' viewpoints."

Also many non-invited persons attended the second workshop, all of which shows how important it had become to take part in the process. The document elaborated for the third and final workshop in November 1999 indicates the aim to increase community participation and social organisation around issues related to the protected area management (*Plan de acción...* 1999). If successful, this could mean the functional and even interactive participation as described by Pimbert and Pretty (1997, 309), and, finally, lead to the real empowerment of the inhabitants. The final result of the whole process - the management plan of Miraflores - is to be published in early 2000.

The organisation of voluntary forest guards is also going through certain transformation. Two leading figures of APROAMI were co-opted as members for the organisation in the beginning of 1999, even though the organisation is in fact a sub-group of UCA-Miraflores. Currently some large landowners have expressed their interest to join the group, in the case that it becomes separated from UCA-Miraflores, and some meetings have already been organised to proceed with the matter. The representation of all the groups in forest guards organisation would be essential for its success in long-term run, therefore its independence from producer organisations would be very important.

Many NGOs and development aid organisations working in the region have also taken the protection of the natural resources in their agenda. Some of them donate barbed wire according to the amount of trees planted by the beneficiary, while others provide house-construction material for the victims of the hurricane Mitch in exchange of reforestation. The activities of these agencies have, in their part, contributed to the increasing consciousness of the need of environmental conservation in Miraflores amongst the local inhabitants.

5.4 Opinions of the protection of Miraflor

There is apparently no strong open opposition toward the overall protection of Miraflor amongst the inhabitants and landowners but the question is, instead, *how* to protect, or *why* to protect. The wider acceptance of nature protection has developed in the region during the recent years, probably due to the active presence and personal contacts of the first MARENA technician in the area, as well as due to new actors, such as APROAMI and different development agencies, promoting the importance of the protected area for a wider public. In the beginning, many people had the fear that the establishment of the protected area will mean sudden restrictions in resource use, all of which gives the impression that the decision-making process over the protection of the area was not so participative as claimed. Now different groups seem to have found their respective reasons to support the protection of Miraflor.

The consequences of the earlier decades' environmental destruction can easily be seen in Miraflor, as elsewhere in Nicaragua, and people have begun to realise that their own survival depends on the nature. Practically all of my informants pointed out that if there are less trees left, there will be less rain and less water, which is the basic requirement for agriculture. In fact, the area suffered from several years' drought in the end of 1980s, and this was said to be one of the motivations behind the increasing environmental consciousness and the initiative for protecting the area.

A protected area is commonly perceived by the inhabitants of Miraflor as a possibility to gather more national and international attention. This is undoubtedly true in the case of Miraflor, which now belongs to the pilot project of PANIF amongst all the protected areas in Nicaragua. The growing importance of Miraflor can be observed for instance in the elevated land prices, when some land-speculators have noted that there might be an opportunity to gain from the protected area. The key-figures of APROAMI stated that one of the reasons to set up the organisation was to represent the interests of the then non-organised producers towards all the institutions operating in Miraflor. My informants supposed that the increased attention will bring improved roads, more financing

possibilities for different projects and development for communities, in general. Especially the *campesinos* expressed their expectations in increased opportunities for employment, even though it was not very clear what these new working possibilities actually could be.

Up to now, different areas and communities within Miraflor have received institutional attention in a fairly unequal way. The most remote communities have been left outside of practically all the projects, even though they are often the areas of most poverty within Miraflor. All kind of information concerning the protected area is also much more limited in those areas than in the more easily accessible and bigger population centres, such as Puertas Azules or El Cebollal, attended by several development projects. Furthermore, it is often the same community leaders and other active inhabitants who participate in all the meetings and training sessions. Those outside this group do not either get invitations to attend, or the activities are organised too far away from their communities. Moreover, many people consider their own everyday life and struggle for survival as the priority, and have little interest and/or possibilities in participating in activities such as the protection of Miraflor. Theodoro, one of the potato producers described his view in the following way:

"...(the protection) doesn't benefit nor harm me. It's OK. I accept it, but I don't have time to run everywhere. No no. They are other people. I dedicate myself to work. It's other people, those who get salary, not me... What do I have to do with the things outside my farm? Nothing. I have my work for which I live from. For me it's OK (to protect), nothing more. I won't loose time running after those matters here and there. I hear about these matters, and then I go to see what do the potato plants need, and my wife."

Despite of hours and hours of training and workshops held by NGOs and government agencies on environmental issues in Miraflor, little concrete results can be seen in practice. This raises the question on how participative the planning and the implementation of these activities has actually been, and how much they have responded to the real needs of the people. The organisations' working practices are often hierarchical and even paternalistic, leaving little space for local empowerment. In the situation, where the organisations apply top-down practices based on strong leadership, mutual exchange of information and the real improvements in the community are not easily achieved. Valenzuela (1999c, 1)

suggests that the low level of community organisation in Miraflores²³ has led to the low participation of the population in the planning and implementation of the projects. On the other hand, representatives of different development organisations argued that many people expect all to be realised almost for granted, without will to invest their own effort in the realisation of the projects.

There are also those who eagerly blame on others for the environmental degradation. According to Augusto, one of the key figures in UCA-Miraflores, it is the new landowners, who have bought land in Miraflores in the past few years, who degrade the environment in their desire to gain the maximum profit, whereas the traditional inhabitants of Miraflores:

"...are not burning, they are the ones who are working with small cultivations in home gardens, and with organic agriculture. They are simple people, who really want their plot to be beautiful, and who really want to protect the natural resources."

The interpretation offered by Augusto is that the traditional inhabitants would protect the environment and recuperate the environmental damage, with the help and guidance of their organisation, if they would only be given possibility to do so. According to Augusto the traditional inhabitants also agree with strict environmental restrictions, since:

"...they themselves proposed it in the Environmental Meeting in 1993", where "it was not difficult to agree on the total prohibition of hunting and wood extraction."

However, in reality there is a strong criticism against the absolute restrictions amongst the members of this organisation and other inhabitants of Miraflores, all of which challenges the interpretation of their willingness to accept the drastic restrictions in the use of natural resources. Augusto himself urged for increased control and criticised the conservation authorities for applying only the general environmental regulations in Miraflores, whereas according to him those should be applied everywhere in Nicaragua, while the stricter regulations should be applied in protected areas. For Augusto, those who oppose the increasing control over the use of natural resources are only a minority in Miraflores and most of them are

²³ The low level of organisation might be due to historical factors, such as the division of different social groups because of the civil war.

outside his organisation. All this illustrates how there are different interpretations on why and how Miraflores should be protected: some people argue for the nature protection with strong restrictions in resource utilisation, while others support environmental conservation for more sustainable use of natural resources.

There is, nevertheless, some kind of consensus among the people of Miraflores that nature protection means, in the end, well-being for the community by improving the environmental conditions for production, and by bringing more institutional support. The core of the problem is, that many people do not have possibilities to change for more environmentally sound ways of production. Don Carlos, one of the long-time medium-scale landowners in Miraflores, described the matter as follows:

"... it's like when you have a dairy-cow, and you drink the milk and give it to the children, but at the same time you would like to sell the cow and use the money for other purpose. You know that if you sell the cow the child won't have what to eat, but you need both things. That's the problem."

This is true especially among the poorest people who have short-term needs of survival, and therefore find it difficult to invest their time or money in protection, even if they know that it would pay back at the long-term. There is a contradiction between the will to protect the environment and the actual possibilities to carry this out. Similarly, those landowners with more resources are used to earn a certain level of income from cattle raising and large-scale cultivations of potato and coffee, and for them the financial benefits are often more important than the protection. Miguel, one of the recent medium-scale producers in Miraflores, put it as follows:

"So for us, to give an example of the contradiction, it's more important to get 10 litres of milk today than to protect a tree for 20 years, because it doesn't give you anything. It's something that gives you today that keeps you going."

Some of the poorest people are obviously obeying the new rules in the use of natural resources just in order to avoid fines, while some of my informants suggested that the fines are too low for the rich landowners, who can just pay the fines and then continue their business as usual. In practice, it seemed that there was no one who had continued the prohibited activities after having had to (even if in some cases several) fines.

People also emphasised the regional, national, and even global significance of the protection of Mirafior, such as serving as "lungs for the town of Estelí"²⁴. According to them, if there were no forests left in Mirafior, the people in Estelí would suffer from a terrible climate, as the other areas around Estelí are mostly deforested. Eugenio, one of the active members of the voluntary forest guard organisation, explained the matter as follows:

"It's a great benefit for all, and I just told to some men that, look, there will become a moment here that many don't believe, that when seeing the trees - like in other developed countries - they'll pay to a campesino for protecting his trees. It can be your source of living, one of the many, but you have to learn that now."

In this situation, it seemed that people were also repeating the slogans promoted by the local organisations and development agencies. They often mentioned that "*of course the protection is for the dwindling flora and fauna*", but afterwards they specified that it is more in order to ensure water for agriculture and to secure the fertility and the suitability of the lands for the next generations that they felt motivated for protection. Religious reasoning was presented as well, and especially the members of the Evangelic churches emphasised the need to take responsibility of the nature that God created.

Many informants also remarked that they as farmers invest in protection, but the state only requires more sacrifices from the farmers without supporting their efforts in any way. Vilma, one of the key-figures in APROAMI, expressed this in the following way:

"... and to really conserve it's expensive, the producer needs to invest much in conserving the environment. However, there hasn't been much support from the institutions to continue to work in it, but well, that's it... The government talks about incentives, for those who live in protected areas, so that they protect and the others can live in a bit cleaner air. But in practice, there are big problems. There's a contradiction between the environment and subsistence... We all have to work for the environment, not only us who are here (in a protected area), but all of us."

²⁴ Forests do not of course work as lungs. However, this expression was often used, probably in order to refer to the role of forests in cleaning air and regulating climate.

Indeed, the General Environmental Law (*Ley general...*1996, Article 42) and its regulation (*Reglamento de áreas...*1999, Article 63) gives possibilities for exemption on the municipal land taxes (and other incentives to be defined by MARENA) on properties, where environmental activities such as conservation projects and scientific research are carried out. APROAMI has started to act on this issue and it is putting much pressure on the authorities of MARENA and the municipality to start applying these articles in Miraflores. Another option is searched in the possibility of obtaining special credits in order to change from current agricultural practices to less degrading ones. This could mean, for example, changing from the extensive cattle raising practices to more intensive ones, or buying a communal coffee-processing machinery which uses less water than the old ones. However, many of my informants stated that it is difficult to get such credits because many properties are without an official land title and one of the requirements in such credits is to have a land title. Many people also had fear to take more credit as the co-operative period left many of them badly in debt.

5.5 Challenges for the management of Miraflores

As Miraflores has almost 5000 inhabitants, and the land is privately owned, the protection of the area can succeed only with the support of the local people. Miraflores definitely can not be an area of total protection, firstly because the people within the area need to make their living from the local natural resources, and secondly because the area is largely modified for agricultural purposes. One of the fundamental questions in this situation is what does nature protection mean in a protected area with such characteristics.

First of all, the economical and social constraints, and the overall possibilities of the local *campesinos* to change their agricultural practices to more sustainable ones should be carefully considered in the management of the protected area. Raul, one of the outsiders, described the strategy of protection in Miraflores as follows:

"When you talk about protecting natural resources, you have to protect the people that live there. And if they are protected, they will protect themselves. You can't protect a protected area, if people don't have money to live on."

At the same time, it is important to acknowledge that there are also many absentee large-scale landowners who make their living from agriculture in Miraflores. Both of these groups – the local and the absentee landowners – will continue to have their income generation necessities also in the future, and should, thus, be taken into account. A total prohibition of the use of natural resources or certain agricultural practices does not seem justified in Miraflores, but instead there is a need for a more controlled use, as well as for incentives and encouragement for more sustainable and environmentally sound practices. To make this realisable, projects offering new alternatives, such as better marketing possibilities for organic products, biological pest control, wood-saving house construction practices, and planting of fruit-trees or trees for fuelwood, are needed. The following citation describes the vision of Eugenio, one of the voluntary forest guards, about the alternative protected area management:

"... one has to be sensible for (the needs of) the campesino - if he wants to build a house and he has 10 or 20 trees, well, let's select those which are the oldest ones, and let him cut timber to make his house. That he can in some way take advantage of the trees... But all this needs control, and training so that that he feels encouraged and responsible, and so he will take care of the rest. Here lives also many rich people, and since they are cattle raisers we have to be sensible for them as well. We could say, well, you can burn this pasture this year, but under control, and next year you don't burn."

It is also important to note that the possibilities of the inhabitants in rural areas like Miraflores to change their productive activities are largely affected by the international and national agricultural and environmental policies. Miguel, one of the organised middle-scale producers, argued that much depends on decisions made in other arenas:

"They are contradictory things: we depend on the policies of here (in Nicaragua), and here they depend on the policies of the outside (world). So for me it is more profitable to produce milk than to protect the environment. I mean, it's not a problem for us only, it's a problem all over the world. In the 50s it was coffee, and all planted coffee; then came the 70s and cotton; and suddenly they decided flowers, and all started to produce flowers. And whenever you changed into something you were told that now the cheles²⁵ want this and that, and that's what we started to produce for them."

²⁵ The word *chelo* is commonly used in Nicaragua and refers to light-coloured people, in general foreigners from the United States and Europe.

As a whole, sustainable development and the improvement of the quality of life of the inhabitants is essential for the overall success of protected area management in Mirafior. Otherwise, there is a risk that the environment will become more and more degraded, given the existing economic and social situation. This need for connecting the development activities into protected area management is even recognised in the *Reglamento de áreas protegidas de Nicaragua* (1999), in its Article 55:

"The central government will develop special incentives, rural development projects, environmental education and other activities in the buffer zones in order to ensure that the inhabitants of the area receive the required training and technical assistance to act according to the management plan of the area."

Protecting the remaining forest patches and changing the agricultural practices to more sustainable ones in Mirafior will also generate regional, national and global benefits, such as protection of the watersheds and regulation of the climate. In this situation it is very understandable that the local inhabitants expect some support from the state and other institutions for protection of nature in the private properties. In fact, it is cheaper for the state to encourage environmental protection through incentives, such as land tax exemption or offering credit possibilities, than to repair the environmental degradation afterwards. Forest in Mirafior is now mostly in the hands of large-scale landowners, and for them clearing the forest is not a question of a mere survival. If there were good incentives, they might leave these forest patches untouched.

In all, there are heterogeneous groups with different needs and expectations, and the protection of Mirafior is strongly interlinked in the power struggles and competing interests between different social actors, such as the producer organisations. Sometimes it seemed as if Mirafior was a small kingdom where there was a struggle over the crown. It might be that the organisations aimed at having hegemony in the area in order to improve and secure their attractiveness to donor financing, and in order to create an established position for the organisations and their leaders in the otherwise uncertain Nicaraguan society. For instance, ecotourism and rural tourism have been promoted as some economic alternatives compatible with the sustainable development of the protected area (cf. López & Rodríguez 1998; Barzev 1999), and so far APROAMI has been the most active

interest group in this field (cf. López & Rodríguez 1998), although UCA-Miraflor also has great expectations on ecotourism activities. These plans are not yet well defined, although the PANIF-project is giving assistance for the local organisations in this respect (cf. Barzev 1999). Currently, there is no infrastructure for tourists, but the PANIF-programme aims to build a visitors centre in the area. At present, only one landowner (European) has organised small-scale rural tourism at his farm with organic coffee, but he has found clients mainly through personal contacts. The crucial question is whether the ecotourism will benefit a wide range of inhabitants, and not only the few well-off landowners that are able to invest in this business. Another question is the touristic potential of Miraflor. There are well preserved tropical forests in the neighbouring country of Costa Rica, as well as in some parts of Nicaragua, and these areas are certainly more attractive to the exigent ecotourists than the small forest patches of Miraflor. In this situation, MARENA's brochure and APROAMI's study on ecotourism, both stating that "*Miraflor has a great diversity of flora and fauna*" and "*it has a plenitude of biodiversity*" seem somehow exaggerated. Similarly, the recent study on the potentiality for ecotourism (Barzev 1999, 1) portrays the forests as one of the principal attractions in Miraflor, and the area as "*free from major signs of environmental degradation*". Promoting ecotourism by such exaggerated words seems questionable in Miraflor with visible marks of environmental degradation. Similarly, implementing rural tourism in the "good-practice" farms of organic production seems to be possible in a very limited area of Miraflor, as organic farming is at present practised by a handful of landowners, and many of these farms are still in an experimental stage.

The role of MARENA in the protection of Miraflor is not very well defined, but the situation is supposed to change when the PANIF-project advances. It will obviously regulate the natural resource utilisation, but to what extent, and how, is still to be clarified. According to the personnel of MARENA in Estelí, the needs of the inhabitants of Miraflor must be respected in the natural resource management. MARENA's role in the process was seen more as a facilitator than a regulator. In many occasions the officials of MARENA stated that the nature conservation must be realised at the level of farms and individuals, because without the local people's support and active participation MARENA can do little.

They commonly held the view that imposing strict restrictions in natural resource utilisation would not be a suitable approach in Miraflor, although they at the same time highlighted that the necessary restrictions should be applied equally to all the people.

6 Conclusions

The context of protection in Miraflor sets a series of challenges for the management of the area. There are human population living within the area and the lands are in the hands of private landowners. The majority of the ecosystems have been modified for agricultural use. This is the reality in most of the other protected areas in Nicaragua as well. One of the special characteristics of Miraflor amongst the protected areas of the country is that the area became protected due to the local initiative, even if this was not realised in a very participative way. As a result, the local organisations, and specifically their leaders, support protection. In difference from most protected areas in Nicaragua with very little institutional attention, Miraflor has had a paid forest guard for some years, and now it has become a pilot project amongst all the protected areas in the country.

The Nicaraguan society is markedly divided into poor and rich segments of the population. In Miraflor, likewise, majority of the population is landless people and smallholder *campesinos* whose livelihood depends directly on local natural resources. However, after the economic and social transition of the last few years, the majority of the land and the remaining forests in Miraflor are in the hands of the large- and middle-scale landowners. There seems to be no strong opposition against the protection of the area, as long as the needs and aspirations of the local people are taken into account. This opinion is also held among many conservation authorities, who admit that in an area like Miraflor there is no hope for success in the protection if the local people are not its beneficiaries.

One of the essential theoretical as well as practical questions is the protection objective of the Miraflor protected area. Strict protection is not a reasonable option

in an area under strong human influence. At the same time the management of the area should be different from that of the surrounding non-protected rural development areas. Within the framework of PANIF, different consultants have suggested that Miraflores, and other similar protected areas, should be defined as an example of sustainable development and rehabilitation of vegetation cover and fauna (e.g. Villa Romero 1999, *Plan de acción...* 1999). These areas could show an example on how to build long-term sustainability and acknowledge human beings as part of ecosystems. In the case of Miraflores, rehabilitation could mean reforestation, conserving the vegetation cover near water sources, establishing organic coffee cultivations with shade trees, and encouraging silvopastoral systems in cattle raising.

It can even be questioned why Miraflores should be protected in the first place, if the area is mostly in agricultural use. Similarly, sustainable development should actually be the aim of all the areas, not just of those under protection. This is usually not the case in practice, and one reason for that is that sustainable development is an issue of very different interpretations and of few practical examples. It is curious to note how diverse interest groups and organisations in their rhetoric build a picture of Miraflores as an existing model for participation and sustainable development, even though this is far from reality. However, changing the course towards more sustainable development in Miraflores is a more realistic option than in many other places in Nicaragua, since there seems to be the will from the side of the inhabitants, and the possibilities for financing the future projects from the side of the international development agencies. The crucial role of the areas like Miraflores could then be in showing the way to sustainable development in degraded protected areas. For the local people the second part of the term, that is, "development", plays an important role. All this means that the *campesinos* have to gain some social and economic benefits if they are to significantly change their ways of using natural resources. Their weak position within the larger society and within the national and global macro-economic situation leave them little power to change their course of life alone. Similarly, the more well off farmers need some feasible alternatives until they are ready to change their systems of production.

The use of natural resources in Miraflor is now regulated in several ways. Fuelwood can not be collected in large amount, cutting trees for construction requires a permission, hunting is prohibited, burning of pastureland should be done in a controlled way, and no new field for agriculture should be cleared from the forest. Along with these restrictions it is important to search sustainable alternatives for production and income generation, such as small plantations of fuelwood, electricity with solar panels and diversification of agriculture to improve the local nutrition and to reduce the dependency on market price fluctuations. Degradation of soil is a serious and ever-increasing problem all over Nicaragua. In Miraflor, this issue needs much attention, as the situation is not yet as severe as in other parts of the country. Alternatives for the excessive use of agrochemicals should be especially studied and promoted.

Regulations are not enough to secure the sustainable use of natural resources in a protected area. This is especially true in an area under private ownership. Therefore different incentives for protection should also be developed. One possibility is the exemption on land taxes. This would have an important symbolical significance, as it would show that the state is acknowledging the private landowners' effort in protecting the environment for a common good. Environmental protection should also offer some alternatives for income generation, for instance through organic agriculture and tourism. In organic agriculture the main problem seems to be in finding the right markets for the products. As for ecotourism or rural tourism, the question is how to ensure the benefits for the community in general, and not just for some individuals with more financial and social resources.

Given the difficult social and economical situation in Nicaragua, many people in Miraflor seemed to perceive the protected area as a "magic solution" for all kind of problems felt in the area. In their dreams, the protected area would bring employment for the poor, income from tourism, financing for the local organisations, national and international donors' attention for the zone. For its status as the pilot project area, this could even to some extent become true in Miraflor, but in other protected areas of the country it is a much more difficult

task. Protected areas can be one tool for rural development, but there are no simple solutions, as the problems are complex and far-reaching.

In any case, there is need for wider participation in the management of natural resources and in the protection of the area in Miraflores. To reach a more profound local acceptance of protection, regardless of political colours, the area should be more clearly associated with MARENA than with one of the two local producer organisations. This is, however, a very delicate issue and conflicts over the matter have already taken place, as the organisations compete for leadership in social status and financing. In this situation, it is important to acknowledge the work that the organisations have already done, as well as to keep them involved in the future. The participation of a wider section of inhabitants in Miraflores has until today been far from interactive, let alone self-mobilisation. The leadership models implemented by the local organisations have often been authoritarian and hierarchical, and as a whole the process of the protected area management in Miraflores has seen little empowerment of the local inhabitants. The alternatives for the use and management of natural resources should be based on the needs and aspirations of the local inhabitants. The heterogeneity of the local population should be considered, instead of taking into account only the opinions of those who have more resources to participate. All this is attainable only through the improvement of different individuals' possibilities to participate in decision-making. In this situation, MARENA should not act as the police of the area, but as a facilitator of protection. Ultimately, the success of protection depends on the will and effort of the local people.

In general, a clear change in the approach towards protected areas can be noted: The protected areas are now considered as an integral part of local and regional development. Like Miraflores, most protected areas in the world have more or less inhabitants within their boundaries. In this context, strict protection is neither a feasible nor a possible solution. Moreover, it is not acceptable in the light of the local people's basic needs of livelihood. For the social and environmental sustainability, the local people need to be involved in the protection at different levels: These include decision-making, management and administration of the area, and sharing the rights and responsibilities of protection. At the same time, it

is important to note that there is no single "view" of protected areas, instead, there are contesting opinions based on different viewpoints and values. Protected areas have also been established in different social contexts and environmental conditions, therefore different areas, require different approaches. An uninhabited virgin forest area calls for a different approach to protection than an area with significant environmental degradation. Similarly, the local people should not be viewed as a homogeneous group in which all the people share the same opinions and the same goals, but as individuals who have different perspectives and priorities that should be balanced. First of all, the conservation efforts in protected areas should include the people, instead of excluding them.

References

- Acosta Blanco, M. R. (1999) *Sistema nacional de áreas protegidas de Cuba*. Paper presented at I Congress on the Planning and Management of Protected Areas. Havana, Cuba.
- Background Information* (1998). Environmental Co-operation Programme Nicaragua-Finland. Jaakko Pöyry Soil and Water Ltd. Ministry for Foreign Affairs of Finland, Department for International Development Co-operation (mimeogr.).
- Barzetti, V. (ed.) (1993) *Parques y progreso. Áreas protegidas y desarrollo económico en América Latina y el Caribe*. Washington D.C.: IUCN.
- Barzev, R. (1999) *Valoración económica del potencial Turístico de las Reservas Natural Miraflor y Moropotente* (Estudio de prefactibilidad de un proyecto turístico). Nicaragua: MARENA/PANIF (mimeogr.).
- Borg, P. & Ormio, H. (1978) *Perustiedot kansallispuistoista. Ihanteet ja käytäntö*. Porvoo: WSOY.
- Documento de avance del plan de gestión ambiental*. (1999) Estelí: PANIF (mimeogr.).
- Dompka, V. (ed.) (1995) *Human population, biodiversity and protected areas: Science and Policy Issues*. Washington: AAAS.
- Fairhead, J. & Leach, M. (1994) Contested forests: modern conservation and historical land use in Guinea's Ziama Reserve. *African Affairs* 93:373, pp. 481- 512.
- Ferreira, C.; Rordíguez, I.; Sharpes, C.(1996) National Park of Paria Peninsula: Local needs global strategies – How to reconcile the conflicts. In: Lewis, C. (ed.) *Managing conflicts in protected areas*. Gland: IUCN, pp. 61-62.
- García, R. (1997) *Biología de la concervación y áreas silvestres protegidas: situación actual y perspectivas en Costa Rica*. Costa Rica: INBio. 66p.
- Ghimire, K. B. & Pimbert, M. P. (1997) Social change & conservation: an overview of issues and concepts. In Ghimire, K. B. & Pimbert, M. P. (eds.) *Social change & conservation: environmental politics and impacts of national parks and protected areas*. London: Earthscan, pp.1-45.
- Gómez-Pompa, A. & Kaus, A. (1992) Taming the wilderness myth. Environmental policy and education are currently based on Western beliefs about nature rather than on reality. *BioScience* 42:4, pp. 271-279.

- Green, M. J. B. & Paine, J. (1997) *State of the world's protected areas at the end of the twentieth century*. Cambridge: WCMC. Paper presented at IUCN WCPA Symposium on "Protected areas in the 21st century: from islands to networks", Albany, Australia.
In internet: www.wcmc.org.uk/protected_areas/albany.htm
- Grönfors, M (1982) *Kvalitatiiviset kenttätömenetelmät*. Juva: WSOY.
- Guha, R. (1989) Radical American environmentalism and wilderness preservation: a Third World Critique. *Environmental Ethics* 1:11, pp. 71-83.
- Guidelines for programme design, monitoring and evaluation* (1997). Ministry for Foreign Affairs of Finland, Department for International Development Co-operation.
- Informe nacional del SINAP de Nicaragua*. (1997) Managua: MARENA (mimeogr.).
- Informe sobre la situación ambiental en Nicaragua* (1996). Managua: MARENA (mimeogr.).
- Ite, U. I. (1996) Community perceptions of the Cross River National Park, Nigeria. *Environmental Conservation* 23:4, pp. 351-357.
- IUCN (1993) *Parks for life. Report on the IV World Congress on National Parks and Protected Areas*. Gland: IUCN.
- IUCN (1994). *Guidelines for protected areas management categories*. Gland: IUCN.
- IUCN (1998) *1997 United Nations list of protected areas*. Gland: IUCN.
- IUCN/CNPPA (1994) *Parks for life: action for protected areas in Europe*. IUCN: Gland.
- Kaimowitz, D. (1996) *Livestock and deforestation. Central America in the 1980s and 1990s: a policy perspective*. Jakarta: CIFOR.
- Kemf, E. (1993) *The law of the mother: protecting indigenous groups in protected areas*. San Francisco: Sierra Club Books.
- Kemf, E. (1996) The law of the mother. In: Lewis, C. (ed.) *Managing conflicts in protected areas*. Gland: IUCN, pp. 48-49.
- Kothari, A., Suri, S. & Singh, N. (1995) People and protected areas - rethinking conservation in India. *The Ecologist* 25:5, pp. 188-194.
- Kothari A., Suri, S. & Singh, N. (eds.) (1997) *Building bridges for conservation – towards joint management of protected areas in India*. New Delhi: Indian Institute of Public Administration.

- Lebonetse, G. (1996) Resolving conflicts about protected areas: the case of Botswana. In: Lewis, C. (ed.) *Managing conflicts in protected areas*. Gland: IUCN, pp. 47-48.
- Ley General del Medio Ambiente* (1996) Ley 217. Republica de Nicaragua. Managua.
- López F., Castillo, M. S., Castillo, M. & Rodríguez, D. (1999) *Plan de ordenamiento y desarrollo ambiental en la Reserva Natural Mirafior, Estelí – estudio del polo turístico Mirafior, primera etapa El Cebollal*. Universidad Nacional de Ingeniería, Facultad de Agricultura. Managua (mimeogr.).
- López, C. I. & Rodríguez, D. (1998). *Desarrollo ecoturístico y agroforestal en la Reserva Natural Mirafior, Estelí*. Documento de trabajo. Managua: APROAMI (mimeogr.).
- McNeely, J. A. (ed.) (1992) *Parks for life: The proceedings of the IV World Congress on National Parks and Protected Areas*. Gland: IUCN.
- Nygren, A. (2000) Environmental narratives on protection and production: nature-based conflicts in Río San Juan, Nicaragua. Accepted for publication in *Development and Change*.
- Orlove, B. S. & Brush, S. B. (1996) Anthropology and the conservation of biodiversity. *Annual Review of Anthropology* 25, pp. 329-352.
- Parks* (1998) 8:1. Population and parks - theme issue. WCPA/IUCN.
- Parks for People* (1994) *Ceres* 26:150, pp. 17-40. FAO.
- Pimbert, M. P. & Pretty, J. N. (1997) Parks, people and professionals: Putting 'participation' into protected area management. In Ghimire, K. B. & Pimbert, M. P. (eds.) *Social change & conservation: environmental politics and impacts of national parks and protected areas*. London: Earthscan, pp. 297-330.
- Plan de acción ambiental* (1994) IRENA-ECOT-PAF. República de Nicaragua.
- Plan de acción, normas y propuesta del sistema administrativo para el manejo del area paisaje terrestre protegido Mirafior-Moropotente* (1999) Estelí: PANIF-APB (mimeogr.).
- Plan operativo anual 1999* (1998). Proyecto de Apoyo a las Areas Protegidas y Biodiversidad. Programa Ambiental Nicaragua-Finlandia. Managua: MFAF-DIDC & MARENA (mimeogr.).

- Plan operativo global 1998-2001* (1998). Apoyo a la Biodiversidad y a las Areas Protegidas. Programa Ambiental Nicaragua-Finlandia. Managua: MFAF-DIDC & MARENA (mimeogr.).
- Project document* (1997) Protected Areas Support Programme. Environmental Co-operation Programme Nicaragua-Finland. MFAF-DIDC & MARENA (mimeogr.).
- Reglamento de áreas protegidas de Nicaragua* (1999) Decreto 14-99. Managua. República de Nicaragua.
- Reglamento forestal* (1993) Decreto 45-93. Managua. República de Nicaragua.
- Richards, M. (1995) *Protected areas, people, incentives: the search for sustainable forest conservation in Honduras*. Rural Development Forestry Network, Overseas Development Institute, Reagents College, London. 7p. In internet: www.generation.net/~derekp/michaelr.html
- Rodríguez, J. (1998) *Metodología de planificación participativa y preparación de procedimientos para planificación y administración del proyecto*. Managua: PANIF-AP (mimeogr.).
- Sánchez Sosa, R. (1999) *La situación ambiental en América Latina y el Caribe*. Paper presented at I Congress on the Planning and Management of Protected Areas. Havana, Cuba.
- Shiön, M. & Ambrogi, R. (1997) Políticas forestales en Nicaragua: Análisis de las restricciones para el desarrollo del sector forestal. In: Segura, O.; Kaimowitz, D. & Rordríguez, J. *Políticas forestales en Centro América: Análisis de las restricciones para el desarrollo del sector forestal*. San Salvador: EDICPSA.
- Shiva, V. (1992) *Biodiversity: a third world perspective*. Penang: Third World Network.
- Shyamsundar, P. (1996) Constraints on socio-buffering around the Mantadia National Park in Madagascar. *Environmental Conservation* 23:1, pp. 67-73.
- Tekelenburg, T. & van Eek, E. (1998) *Resultados del proyecto piloto análisis ambiental estratégico (AAE) del municipio de Estelí. Plautas para planes y políticas de desarrollo sostenible*. Estelí: ASDENIC, CURN, TROPISEC, ADESO y Secretaría de Medio Ambiente de la Alcaldía de Estelí (mimeogr.).
- TROPISEC (1998) *Estudio agroecológico del área de influencia del Proyecto TROPISEC*. Managua (mimeogr.).
- UCA-Miraflor (1993) *Informe del primer encuentro sobre el medio ambiente de Miraflor* (mimeogr.).

- UNDP (1999) *UNDP Human Development Report 1999*. New York: Oxford University Press.
- UN/UNEP (1992) *United Nations Convention on Biological Diversity*. In internet: www.unep.ch/bio/conv-e.html
- Utting, P. (1993) *Trees, people and power. Social dimensions of deforestation and forest protection in Central America*. London: Earthscan.
- Valenzuela, G. (1999a) *Caracterización bio-física de Miraflor*. Managua: PANIF (mimeogr.)
- Valenzuela, G. (1999b) *Caracterización socio-economica de Miraflor*. Managua: PANIF (mimeogr.)
- Valenzuela, G. (1999c) *Evaluación del compromiso ambiental de las comunidades "Área protegida Miraflor"*. Managua: PANIF (mimeogr.)
- Villa Romero, J. (1999) *Áreas protegidas y desarrollo sostenible*. Paper presented at I Congress on the Planning and Management of Protected Areas. Havana, Cuba.
- Wells, M. P. & Brandon, K. B. (1992) *People and parks: linking protected areas management with local communities*. Washington DC: World Bank.
- Wells, M. P. & Brandon, K. B. (1993) The principles and practice of buffer zones and local participation in biodiversity conservation. *Ambio* 22:2-3, pp. 157-162.
- West, L. (1996) Protected area management and human-related conflicts in Latin America: El Angolo Hunting Reserve, Peru. In: Lewis, C. (ed.) *Managing conflicts in protected areas*. Gland: IUCN, pp. 45-46.
- WRI, IUCN, UNEP (1992) *Global biodiversity strategy: guidelines for action to save, study and use earth's biotic wealth sustainably and equitably*. Washington: WRI, IUCN, UNEP.
- Yin, R. K. (1994) *Case study research - design and methods*. Newbury Park: Sage Publications.

Newspapers and magazines:

El Nuevo Diario. Inseguridad sobre la propiedad propicia el monopolio – Con el mercado de tierras retorna la concentración. 13.04.1999.

Naturaleza (1999) Revista del MARENA.15: añoV.

Personal communications:

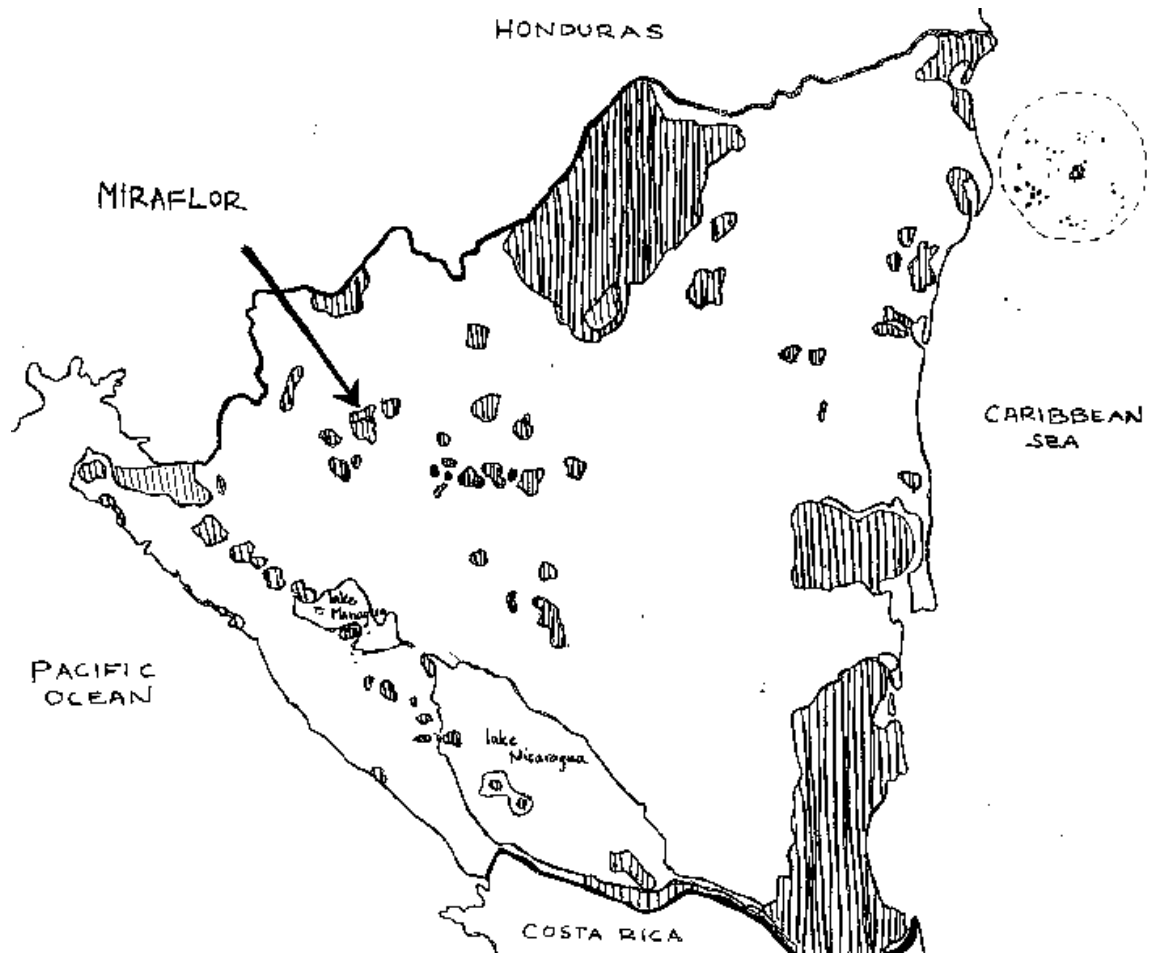
Gómez Guevara, Julio César (1999) Director of protected areas of the department of Estelí, MARENA. Interview with the researcher, 18th June 1999, Estelí.

Rueda, Ricardo (1999) Prof. in botany, Universidad de León, Nicaragua. Interview with the researcher, 15th April 1999, Estelí.

Torres, Harold (1999) Veterinary engineer. Technician of MARENA in Mirafior, previously working at agricultural products retailer's. Interview with the researcher, 27th May 1999, Estelí.

APPENDIX I

Map of protected areas of Nicaragua.



Source: modified from MARENA 1996.

APPENDIX II

Workshops and meetings participated during the fieldwork period:

12.04.1999	Meeting of members of APROAMI and project personnel on elaboration of the proposal of ecotourism. Estelí.
14.04.1999	Workshop of <i>Mujeres Organizadas</i> of La Pita. El Cebollal, Mirafior.
16.04.1999	Meeting of the voluntary forest guards. El Cebollal, Mirafior.
20.-24.04.1999	Gathering of information on land tenure in different communities of Mirafior and Moropotente.
05.05.1999	Training of facilitators of the workshop on the management plan of Mirafior. Estelí.
11.-12.05.1999	First workshop on the participatory elaboration of the management plan of Mirafior: identification of problems related to the use of natural resources and the organisation of the community, and the causes of these problems. El Cebollal, Mirafior.
13.05.1999	Visit to an ecotourism complex Selva Negra. Matagalpa.
25.-26.05.1999	Further elaboration of the results of the first workshop with other facilitators. Estelí.
01.06.1999	Meeting of the voluntary forest guards. Moropotente.
01.-06.06.1999	Participation in the field-work of the socio-economical survey of Mirafior-Moropotente.
13.-20.06.1999	I Congress on the Planning and Management of Protected Areas. Havana, Cuba.
24.-25.06.1999	Second work-shop on the participatory elaboration of the management plan of Mirafior: identification of possible solutions to the problems formulated in the first workshop.