

**A CRITIQUE OF DEVELOPMENT AND CONSERVATION POLICIES  
TO PROMOTE SUSTAINABLE LIVELIHOODS IN ENVIRONMENTALLY  
SENSITIVE REGIONS IN DEVELOPING COUNTRIES**

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**Reference to the Region of the Lençóis Maranhenses, Brazil**

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**Abbreviations**

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APA	Área de Proteção Ambiental (Environmental Protected Area)
BNB	Banco do Nordeste do Brasil (Bank of Brazilian Northeast)
DFID	Department for International Development
EIA	Environmental Impact Assessment
EMBRATUR	Empresa Brasileira de Turismo (Brazilian Tourism Agency)
GEPLAN	Gerência de Planejamento e Desenvolvimento Econômico (Planning and Economic Development Administration)
GETUR	Subgerência de Turismo (Tourism Subadministration)
IBAMA	Instituto Brasileiro do Meio Ambiente e dos Recursos Renováveis (Brazilian Institute of the Environment and Renewable Resources)
IBDF	Instituto Brasileiro de Desenvolvimento Florestal (Brazilian Institute of Forest Development)
IBGE	Instituto Brasileiro de Geografia e Estatística (Brazilian Institute of Geography and Statistic)
IDB	InterAmerican Development Bank
IIED	International Institute for Environment and Development
IUCN	World Conservation Union
MA	Maranhão
NE	Nordeste (Brazilian Northeast Region)
NUPAUB	Núcleo de Apoio à Pesquisa sobre Populações Humanas e Áreas Úmidas Brasileiras da Universidade de São Paulo (Research Centre on Human Population and Wetlands, University of São Paulo)
PETROBRÁS	Petróleo Brasileiro S/A (Brazilian Petrol S/A)
POCOF	Posto de Controle e Fiscalização (Post of Control and Fiscalisation)

PRODETUR	Programa de Ação para o Desenvolvimento do Turismo no Nordeste (Action Programme for the Development of Tourism in the Northeast Region)
SEMA	Secretaria Especial de Meio Ambiente (Special Secretariat for the Environment)
SUDEPE	Superintendência do Desenvolvimento da Pesca (Superintendence for the Development of Fishing)
SUDENE	Superintendência do Desenvolvimento Do Nordeste (Superintendence for the Development of Northeast)
SUDHEVEA	Superintendência da Borracha (Superintendence for the Rubber)
UEMA	Universidade Estadual do Maranhão (Maranhão State University)
UNEP	United Nation Environment Programme
UNESCO	United Nation Educational, Scientific and Cultural Organisation
WWF	World Wild Fund for Nature

This study is part of a process which started two years ago when I first visited the region of the Lençóis Maranhenses in Brazil. I observed that regional development was occurring without any clear government policy towards environmental conservation and without resident peoples being involved in the political process. I intent to investigate this further and the subject of this dissertation is an attempt to achieve this objective. In July 1999, I conducted a small field research in the region focusing on Atins, which is a fishing village as presented in Appendix 1. This choice was also based on the proposal of finishing this Master degree in twelve months.

**Atins** is situated in the mouth of the Preguiças River. It has a population of six hundred inhabitants most of whom regard Atins as the 'entrance' of the Lençóis Maranhenses National Park even though, as will be analysed further, the village does not fill within the official boundaries of the Park. It has many migrants from other states and localities who are attracted to Atins because of its reputation as a 'good place for fishing'. There is a subsistence economy related to two major seasonal activities – fishing and agriculture.

The village is divided into family groups as part of their socio-economic basis on extended family strategies. The village has one elementary school, one health post and one telephone. There are no land titles as the area is the property of the federal government nor any local political organisation. Generally, girls opt to continue studying in Barreirinhas, the seat of the region, and São Luis, the state capital while boys prefer to remain in Atins and fish.

Two years ago electricity was brought to the village at the same time as a non-paved road was built by its own inhabitants, connecting Atins with Barreirinhas. These developments together with the introduction of commercial practices in fishing in the littoral and the emergence of tourism in the region due to the Lençóis Maranhenses National Park, represent the beginning of a rapid process of structural change in local nature–society interaction.

I am grateful to those who have made this dissertation possible. Although I am responsible for the research and writing, this study is in many ways a cooperative effort. Special thanks to Benedicto, Rosane, Priscila, Mariane, César, Rosângela and Luis Carlos Meregé for their time, stimulus and support to nurture this process from its conception to conclusion. I would like to extend my profound appreciation to Antônio Carlos Diegues at the NUPAUB who has done much work behind-the-scenes during the last year.

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This dissertation is dedicated to André, my fisherman.



Atins, 1999

Protected areas have been designated as one of the principal strategies for environmental conservation particularly in developing countries. Emerging in a context of capitalist consolidation, rapid urbanisation and frontier development in the late nineteenth century in the United States, protected areas paradigm has been strictly based on subjacent preservationist ideology of a negative nature–society relation (Nash 1989). Vast remnants of American scenic ecosystems conceived as ‘wilderness’ were enhanced and protected from human occupation and alteration, ensuring nature preservation for the admiration and pleasure of urban-industrial society, which had been losing its daily contact with nature (Sellars 1997).

The transposition of this ‘wilderness’ paradigm to developing countries, however, has neglected many socio-economic dynamics and resource management practices, which have been fundamental to nature conservation (West and Brechin 1991). According to Gómez-Pompa and Kaus (1992:273), ‘traditional conservationists, on the other hand, see the aesthetic, biological and ecological value of the same land but do not necessarily see the people. They often fail to see the effects of past or current human actions, to differentiate among types of human use, or to recognise the economic value of sustainable use’.

In fact, protected areas have been systematically implemented in environmentally sensitive regions usually isolated from urban-economic centres and occupied (even altered) for generations by ‘traditional’ populations and ‘pre-capitalist’ societies (McNeely 1995). Characterised by little development pressures and consumption patterns and small-scale economy of subsistence, many of these ‘traditional’ peoples have managed the environment within a complex socio-environmental organisation directly related to their livelihoods. As a result, these processes have been marked by very low impacts on the resource base and contribute to the ‘sustainability’ of their ecosystems (Diegues 1994, Sachs 1999).

Environmentally sensitive regions, therefore, have experienced a rapid process of transformation against a background of tension among environmentalists, developers and resident peoples. This has deeply undermined the protection of such fragile ecosystems and the resident populations’ livelihood in developing countries (Wells and Brandon 1995). While the protection of the fragility and unity of their ecosystems has been the focus of many conservationist policies by means of protected area designation, the aesthetic and natural richness of their resource base have interested profit-oriented enterprises through tourism development. Meanwhile, resident peoples have been continuously kept outside the mainstream political sphere, promoting tensions between protected area paradigm and their control over natural resources (West and Brechin 1991).

This dissertation analyses the policy making challenges in reflecting and crossing the boundaries of development and environmental conservation to transformative policy, integrating the strengthening of sustainable livelihoods into the development and conservation of environmentally sensitive regions in developing contexts. It argues that the non-acknowledgement of resident people's livelihood strategies in early environmental movement and policies for development and conservation of environmentally sensitive regions has promoted conflicts over the control of natural resources. Indeed, it has undermined the achievement of conservationist aims and the improvement of resident people's lives, fundamentally constraining the capabilities of peoples maintaining their means of living while not undermining the natural resource base, understood as *sustainable livelihood* (DFID 1998, Chambers 1985).

Understanding the root causes of the impacts of development and conservation policies on resident peoples' livelihoods and environmental unity may represent a starting point for pondering on an integrated environmental development policy towards the promotion of sustainable livelihoods and nature conservation in environmentally sensitive regions in developing countries.

These issues are analysed in the specific context of the Lençois Maranhenses in Brazil, one of the poorest regions of the country composed by many 'traditional' communities. Comprising approximately thirty thousand inhabitants spread in 264 localities, the region has one of the major diversity of ecosystems of the country such as mangroves, rivers, dunes, *cerrado*, *restingas* and *babaçus* reserves. This selected case study is illustrative of a context of rapid structural changes in the resident peoples' livelihoods interaction with nature through the introduction of development and conservation policies which have promoted tensions among various actors, aggravating a process of social exclusion and environmental disruption. This scenario also represents a challenge to develop a political agenda for regional development and environmental conservation. This is contrary to what has taken place in the majority of coastal regions throughout Brazil which have already been impacted by early development conservation *rationality* through the expulsion of resident peoples and profound environmental disruption.

Focusing on the fishing village of Atins, this study aims to contribute to a deeper understanding of the implications of this scenario on resident peoples' livelihood strategies, regional socio-economic dynamics and environmental unity. It examines three main issues. Firstly, regional context of geographic and social 'isolation' which has contributed to the development of particular socio-economic networks and resource management practices and, to some extent, its environmental conservation. Secondly, the designation of the Lençois Maranhenses National Park in 1981 and the Environmental Protected Area – APA Pequenos Lençois in 1991, which has brought into the region diverse political interests, challenging protected area paradigm to nature conservation in developing contexts. Thirdly, the 'development' process actually facing the region



due to the incorporation of modern techniques of resource management, the construction of an interstate road and government policy for regional economic development based on tourism.

This dissertation has three main chapters. The first chapter examines the context which gave rise to the creation of protected areas paradigm, focusing on the implications of continuous reliance on economic 'modernisation' policy for the development of environmentally sensitive regions in developing countries. It examines proposed alternatives in environmental management towards the resolution of the present scenario of socio-environmental conflicts in most protected areas as well as the power relations underlying this debate.

Aiming at contextualising previous theoretical debate, the second chapter discusses the establishment of the first protected areas in Brazil. Focusing on the case of the Lençóis Maranhenses, it presents regional socio-economic dynamics and resident peoples' livelihood strategies as well as government proposals for its economic development.

Using as a framework the theoretical debate and the case study presented, the third chapter analyses the effects of designation of the Park and the APA on resident peoples' livelihoods and, consequently, regional environmental sustainability. Underlying this analysis, it brings into debate the power relations behind dominant development and conservation rationality, questioning the appropriateness of the adoption of prevalent economic development and protected area paradigms in environmentally sensitive regions in developing countries.

## **DEBATE ON DEVELOPMENT AND CONSERVATION POLICIES IN ENVIRONMENTALLY SENSITIVE REGIONS IN DEVELOPING CONTEXTS**

An examination of the implications of modernisation development model and neoliberal policy is relevant to this study in order to understand the context which has given rise to the creation and enforcement of protected areas paradigm. It is also important to examine the way in which government development policies have approached 'traditional' structures of resource management and nature values.

Focusing on development and conservation processes facing environmentally sensitive regions in developing countries, this chapter examines the origins of the National Park movement, the emergent resource management rationality and the ideological foundation of modern environmental movement in the United States. The later has had a profound influence on conservationist policies in developing countries. Finally, it examines the impact of the American experience in developing contexts, the methods adopted in the resolution of socio-environmental conflicts in most protected areas and the power relations underlying this debate.

### **1 IMPLICATIONS OF MODERNISATION DEVELOPMENT POLICIES FACING DEVELOPING COUNTRIES**

The history of development policy has revealed the failure of modernisation theories in providing welfare, satisfying social demands and improving the living conditions of the great majority of people. In addition, there is an unseen environmental disruption within most developing countries.

Based on the so-called 'belief in progress', early development paradigm widely assumed that by emphasising large-scale enterprises and infrastructures, stimulating the attraction of services investment and transforming traditional means of production into modern ones, there would be a 'trickle down' effect distributing social benefits of growth downward to low income groups (Opschoor 1990:193).<sup>1</sup> These processes would promote 'economic development' and 'modernisation' through technology, urbanisation and industrialisation, transforming low-productive subsistence practices and limited spatial mobility of 'traditional' societies into high-productive and dynamic modern industry. Consequently, economic growth would create wage of employment, increase people's capacity for consumption and improve their quality of life. As Dube (1988:3) notes, 'the trickle down effect of overall per capita GNP growth was expected to provide more jobs and economic opportunities, ensuring wider diffusion of the benefits of growth'.<sup>1</sup>

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<sup>1</sup>The modernisation theory is generally attributed to Rostow (1967) concept of an evolutionary development movement towards 'modern societies'.

Instead of the adoption of a development movement for the promotion of greater social and economic equality within a 'modern society', the visible result of the continued reliance on economic growth and modernisation has been an asymmetric development process and polarised productive structure in which the expected economic benefits have been concentrated in few hands (Sachs 1999). As Barkin (1997:39-40) states, 'new growth patterns are undermining the viability of traditional small and medium-scale producers, transforming markets and channelling capital to the larger producers, controlled by the emerging elites'.

Indeed, the implicit societal changes of this development paradigm have disrupted 'traditional' forms of production, causing a profound impact on the living conditions especially of those who have been systematically excluded from the economic-political arena (Sandercock 1998, Welford 1997). In this context, Barkin states that 'the majority of people... marginalised from the productive system... could not achieve, or were not allowed to achieve, the same measure of security that traditional social and productive structures once afforded'. Relying on measures to generate income by improving productivity levels mainly of subsistence practices, this paradigm has placed a great deal of emphasis on the prioritisation of social investments towards the integration of even self-sufficient small activities and large-scale infrastructure into the general development process (Burgess *et al* 1997).

The absence of a broader understanding of the compatibility and implications of these measures in particular contexts such as environmentally sensitive regions has reinforced the process of impoverishment and exclusion of many small-scale 'traditional' producers. As a result of the loss of their subsistence practices many of these peoples have migrated to the poor peripheries of urban centres (Barkin 1997).

Recently, the rise of neoliberal policy has redefined the relationship between government-society and government-economy, aggravating the above scenario. Governments have been increasingly compelled by corporate forces to defend global economic interests even in face of widening social, economic, spatial and environmental disparities within and among countries (Friedmann 1998). This global capitalist logic through the continuous guidance of enterprise organisations concerned with a short-term profitable markets and private ownership has – even intentionally – separated economics from environment and reinforced the dominant development ideology based on individual interests and economic efficiency. According to Harvey (1999:166), 'given the power of money, it is vital to show that ecological modernisation can be profitable. Environmental care, it is argued, often contributes to efficiency (through more efficient fuel use, for example) and long-term preservation of the resource base for capital accumulation'.

One significant aspect of this process is the way in which nature has been viewed as a commodity whose values are determined according to its economic meaning. It means that not

only its unity and primary values have been reduced to an utilitarian-oriented ethic, but also that disappearing 'environmental capital can be replaced by produced capital' (Opschoor 1990:193). As Welford (1997:7) states, 'there is now, a dominant corporate culture which believes that natural resources are there for the tacking and that environmental and social problems will be resolved through growth, scientific advancement, technology transfer via private capital flows, free trade and the odd charitable hand-out'.

Sachs (1999:25) observation on the results of this development paradigm is illustrative: 'the world might have developed – but in two opposite directions'. Indeed, the features of this political-economic development pattern have rapidly changed the nature and dynamic of cities and regions, cresting growing disparities in political and financial power while undermining local economies, livelihoods and nature (Cohen 1997).<sup>2</sup> The consequences of this process have deeply affected the social, political and economic system on a global scale. The impacts on livelihood strategies, the vulnerability of those excluded people and the effect on natural environment integrity in developing countries, have been compared by many authors to colonial times (Sachs 1999, Rodrigues 1999).

For a better understanding of the implications and challenges of contemporary development policy towards the resolution of environmental degradation and social exclusion, the following issues are examined in the perspective of protected area designation in environmentally sensitive regions in developing countries.

**2 DEBATE ON PROTECTED AREA PARADIGM IN DEVELOPING COUNTRIES**

**2.1 Roots of the United States National Park Movement**

The United States national park movement has its roots in the nineteenth century within a context of capitalist consolidation and rapid urbanisation of what was considered its 'wild' western territory. As Sellars (1997:1) states, 'preserving remnants of the wild landscapes of the frontier, the parks were from the beginning a part of frontier history and romantic western lore'.<sup>3</sup> In that time, according to Nash (1989:35):

'The majority of the territory claimed by the United States was wilderness. The inexhaustibility of resources was the dominant American myth for a century after independence. ... Even people critical to resource exploitation could not escape the feelings that there was, after all, plenty of room for people and nature in the New World. The

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<sup>2</sup> This political and economic system has been essentially characterised by quantitative disposability and overexploitation of natural resources, cheap labour, capital accumulation and transfer of technology (from developed to developing countries) within a context of international security and prosperity of a dominant elite (Cavaco 1999:94).

<sup>3</sup> According to Sellars (1997:1), 'the national park system grew to include areas in the East and Midwest while continuing to expand in the West, where it had begun and where the majority of the older and more famous parks are located'.

Indians were full cry then; much of the West was wild. In this geographical context progress seemed synonymous with growth, development and the conquest of nature’.

Consequently, the Homestead Act was passed in 1862 enabling any American citizen to acquire the property rights of his/her cultivated ‘empty’ land (Diegues 1994). This process led to rapid and profound environmental transformations through consumptive uses of natural resources such as logging, mining and reservoir development. In ten years, the evidence of high environmental costs of frontier development policy and urbanisation process were translated into widespread uncertainty.

Against this background Yellowstone was created marking a historic step in nature preservation by preventing occupation, exploitation and division of its majestic pleasing landscape and ensuring a means of recreation to be ‘democratically’ shared and enjoyed by rich and poor alike.<sup>4</sup> It was felt that the preservation of reminiscent large ‘wild’ areas for public recreation could prevent other far more consumptive and exploitative forms of natural resources such as logging and dam building. According to Sellars (1997:16), over time this concept gave rise to a ‘politically viable rationale’ for national park movement in which utilitarian use of natural resources by recreational tourism development would ensure nature preservation. Further analysis will reveal that this development conservation rationality can deeply influence the designation of protected areas worldwide, fostering a paradoxical model in the history of nature preservation.

Despite the ‘democratic’ concept of protecting nature, as Sellars (1997:9-10) notes, national parks served *de facto* from the very beginning corporate profit interests. Yellowstone legislation was deeply influenced by the Northern Pacific Railroad Company, which seeking to establish monopolistic trade corridor across the West, lobbied for the creation of a federally controlled park, preventing further private land claims. In addition, private corporations through ‘strict’ association with the federal government has decisively influenced the definition of western kind of land use and economy by stimulating the creation of public parks and tourism development. In the words of Sellars, ‘with magnificent scenery as the principal fount of profit, tourism was emerging in the nineteenth century as an economic land use attractive to business investment. The success of such investment depended... on the preservation of scenery’ as well as ‘federal co-operation to manage vast scenic areas in the West and control development’.

## 2.2 Emergent Resources Management Policy

The growth of urban society, the construction of railroads and the striking majestic of the mountains, canyons and geysers of Yellowstone played an important part in the popularisation of

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<sup>4</sup> In 1905, President Roosevelt declared that the preservation of nature by means of national park was considered as ‘essentially a democratic movement’, benefiting the American people (Sellars 1997:14).

the national park ideal and stimulated tourism. The emergent natural resources management policy influenced by the above development conservation rationality can well be characterised as an early profit-oriented approach to national parks. To ensure public enjoyment, access roads were built and modest even 'rustic' accommodations were substituted by comfortable chalets and hotels typically located near favoured scenic attractions. In addition, as Sellars (1997:124-5) states, the natural environment was systematically manipulated through a selective protection of scenic ecosystems and large mammals, ignoring species less attractive, combating poaching, killing undesirable predators, and stocking fish populations.

It is worth observing the non-acknowledgement of Native Americans resource management practices, their intensive use of natural resources and rights to their ancestral lands in early national park movement.<sup>5</sup> Conversely, the establishment of parks in 'empty wild' lands reinforced a process that started with the conquest by the West in which indigenous peoples were exterminated or expelled from their territory and taken to reserves which, according to socio-political thought of that time, were 'sufficient for their use' (Diegues 1994:25).

In fact, instead of being based on socio-ecological and scientifically informed environmental policy, national park paradigm has been defined as a reaction against the dominant practice of exploitationism widely shaped by corporate interests (Norton 1991). As Sellars (1997:290) states, 'beginning with the construction of Yellowstone's roads and lodges, the history of development and use of the parks for tourism extends for more than a century and reflects an entrenched perception of the purpose of national parks'. The advance of science, ecology and culture as more comprehensive means of informing protected area designation and resource management has presented a major challenge to environmental policies.

### 2.3 Ideological Foundation of Early Environmental Conservation Movement

Theoretically, national park paradigm has influenced two conventional schools, preservationists and resource conservationists, representing a polarisation in values within environmental protectionism. While preservationists are concerned with aesthetic nature protection from human alteration, resource conservationists perceive natural ecosystems and other species as resources to be wisely used for human benefit and development (Norton 1991:6-7). This dilemma has been personalised by the disputes between the two great leaders of the early environmental conservation movement, John Muir and Gifford Pinchot (Diegues 1994).

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<sup>5</sup> According to many authors, Yellowstone and other parks were established in indigenous territory, which although considered as 'isolated' and 'wild' areas, had already been partially altered by Native Americans (McNeely 1993, Diegues 1994).

Following the tradition of early naturalists, which valued species and aesthetic landscapes by observing nature and interpreting metaphysically scientific facts, John Muir became a leading theoretician for wilderness preservation.<sup>6</sup> As Norton (1991:7) notes, Muir conceived a holistic perspective mixing religion and morally inspired preservation by rejecting and reinterpreting anthropocentric ideas that nature exists exclusively for human benefit and utilitarian use. In Muir's own words:

'How narrow we selfish, conceited creatures are in our sympathies! How blind to the rights of our fellow mortals! Though alligators, snakes, etc naturally repel us, they are not mysterious evils. They... are part of God's family, unfallen, undepraved, and cared for with the same species of tenderness and love as is bestowed on angels in heaven or saints on earth'.<sup>7</sup>

Opposed to preservationists' values, Gifford Pinchot developed a scientific and economically motivated forest management policy based on utilitarian criterion for resource conservation, developing and leading the forestry profession as a major force in the United States (Norton 1991). Pinchot's ideas, according to Nash (1989:35), were deeply 'imbued with the ethos of the Progressive era to which he belonged', identifying 'development as the first principle of conservation'. He emphasised the 'use of the natural resources for the greatest good of the greatest number for the longest time' by minimising inefficient exploitation, use of non-renewable resources and production of waste and ensuring maximum sustainable productiveness.<sup>8</sup> Pinchot's approach, however, encouraged monocultural cultivation of fast-growing single species and marketable trees on an individual basis, non-interrelating natural phenomena and even the consequences of one intensive resource management in other ecosystems.

Despite their divergent policy goals and emphasis on quite different values, it has been suggested that Muir and Pinchot's concerns about nature preservation were essentially *reactive*. Norton (1991:37-8) stated that their common effort in creating distinct policies of protection against early exploitative approaches to resource development and social trends of privatisation was based on a complex ideology to justify their preservationist rhetoric and attitudes rather than on a coherent philosophy previously elaborated.

It is also important to notice that in both discourses there is no mention of 'traditional' forms of resource management. Nevertheless, Norton has indicated that their particular set of values and

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<sup>6</sup> Wilderness preservation and intellectual concerns for nature value in the United States were influenced by the writings of the transcendentalist Henry David Thoreau. He believed that 'using intuition, rather than reason and science, humans could transcend physical appearances and perceive the currents of the Universal Being binding the world together' (Nash 1989:35-7). The publication of geographer George Perkins Marsh' classic *Man and Nature* in 1864 also marked early preservationist movement through an original analysis of the negative impacts of development and conversion of wilderness into civilised and productive land (Norton 1991:23).

<sup>7</sup> Muir, John, 1981 (originally published in 1916), *A Thousand-Mile Walk to the Gulf*. Houghton Mifflin, Boston. Pages 98-9 (Quoted in Norton 1991:7).

<sup>8</sup> Pinchot, Gifford, 1987 (originally published in 1947), *Breaking New Ground*. Island Press, Washington, D.C. Pages 325-6 (Quoted in Norton 1991:23).

ways of looking at the world deeply influenced early conservationist policy making and left powerful legacies which provided the basis for further 'overlapping and even politically complementary, options to exploitation'.<sup>9</sup>

Aldo Leopold challenged this environmentalist dilemma, formulating a broader and ethic vision towards more harmonious society-nature relationship.<sup>10</sup> As Norton (1991:60) points out, Leopold greatest legacy was to elaborate Muir's aesthetic science and to question Pinchot's productive-oriented methods of resource management, defining an alternative environmental policy. By questioning human ability to manage the ecosystem and recognising the need to impose limitations on economic determinism and its short-term values, he intended to guide human use of the environment towards a 'new and more appropriate ethic – a land ethic' which could 'alter posterity's conceptions and perceptions of the world'. For him 'the adoption of a land ethic would represent a major shift in human consciousness' on nature intrinsic values (Norton 1991:82). To quote Leopold:

'A land decision is right when it tends to preserve integrity, stability and beauty of the biotic community and community includes the soil, watershed, fauna and flora, as well as people. It is wrong when it tends otherwise'.<sup>11</sup>

Leopold's contextual integration has represented an unprecedented step forward in environmental conservation by bringing into the debate the validity of environmentalists' premises on resource management, seeking for more sophisticated and scientifically informed practices. According to Sellars (1991), however, the emergence of this wider ecological and scientific perspective was viewed by many national park managers, policy makers and post-war ecologists as costly, difficult and time-consuming. Consequently, Leopold's comprehending ethic vision on environmental conservation was narrowed towards a more abstract, quantitative and reductionist science, going back to development conservation rationality and preservationist-conservationist dilemma as the basis of environmental management and conservation policy (Nash 1989).

It is exactly this 'conservationist paradigm' that influences environmental policies in developing countries, although the clear differences between their socio-cultural, physical, economic and political contexts and development pattern (West and Brechin 1991, Diegues 1994, Wells and Brandon 1995).

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<sup>9</sup> For instance, Pinchot's ideas influenced the development of conservationist ideology and policies. As Nash (1989:35) argues, 'those who have inquired into the historical roots of the modern conservation doctrine have generally traced its popularisation in North America to Gifford Pinchot, the first chief of the United States Forest Service'.

<sup>10</sup> Leopold has been considered as the most important figure in the history of modern environmental management (Norton 1991).

<sup>11</sup> Leopold, Aldo, 1949, *A Sand County Almanac*. Oxford University Press, New York. Pages 224-5. (Quoted in Diegues 1984:32).



## 2.4 Impacts of the United States Conservationist Paradigm on Sustainable Livelihoods in Developing Countries

A central issue regarding the direct adoption of Yellowstone paradigm in developing countries has been the promotion of socio-environmental conflicts over access and control of natural resources. As West (1991:16) notes, the United States' preservationist aims 'fit nicely into their overall system in which other protected areas are given over to multiple uses and managed for sustained-yield production in support of economic growth and development'. In addition, 'most of the population is now urban-based and do not need to subsist directly from the land. Many developing countries lack this larger context'.<sup>12</sup>

One major characteristic of developing countries is exactly the coexistence of 'indigenous' peoples with urban-industrial society (Diegues 1994). Living in regions distant of urban-economic centres where the capitalist logic of consumption and production have not yet been totally incorporated, many of these 'traditional populations' have developed complex social, cultural and environmental dynamics for their livelihood (McNeely 1995). Considered as 'pre-capitalist' societies, their small-scale economic system has been based on production for subsistence, leading to very low impacts on the resource base, which have contributed to the sustainability of their ecosystems.

Throughout history, many 'traditional peoples' from the North to the South and from the East to the West have sustainably managed environmentally sensitive regions to obtain efficient and equitable benefits of nature, representing the main source of their livelihood. Although directly dependent on the intensive use of resources, different cultures have shared similar characteristics such as low population density, consumption patterns, technological development and levels of pollution, which have contributed to a limited interference in the carrying capacity of resources base (Berkes 1999). It could, therefore, be argued that environmental preservation lies not only on resource management practices based on the diversification and combination of activities such as fishing, agriculture, harvesting and production of handicraft, but also on a long process of cultural-ecological adaptation and respect for natural cycles. As Berkes (1999:159) states, it is important to 'recognise indigenous resource management systems not as mere traditions but as adaptive responses that have evolved over time'.

It is in these regions, however, that protected areas have often been systematically implemented by centralised government decision making and with no major concerns to the existing social contexts and economic-environmental dynamics. Indeed, many governments and conservationist organisations have disregarded the 'traditional' resource management practices and knowledge of

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<sup>12</sup> According to Wells and Brandon (1995:1), the 'most celebrated natural areas have been granted official conservation status through designation as a national park or other protected category'. It means that five percent of the Earth's surface is legally protected by means of approximately 7,000 protected areas in 130 countries.

many resident peoples in sustaining their environmentally sensitive regions (West and Brechin 1991, Wells and Brandon 1995).

In practice, government policies have promoted compensation schemes, income generating projects and substitution of traditional techniques and management practices aiming at reducing the costs of conservation as resident peoples will become, at least in theory, less dependent on local natural resources as a unique source of their livelihood. Although these interventions may appear as positive initiatives, they have been provided with no adequate social and economic evaluations on changes and impacts that they may provoke on livelihood strategies of resident peoples (IIED 1994). Many solutions, priorities and economic alternatives have been defined and provided far from local resource management practices, knowledge and potentials, neglecting the fact that many communities have already established a long process of regional adaptation (Diegues 1992).

Loss of cultural integrity, socio-economic autonomy and impoverishment of many resident peoples in and around designated protected areas have been the historical result of this process. In some extremes, the disruption of their resource management systems has forced them to migrate to the *favelas* of urban areas or to live within the boundaries of the protected area with few or no economic alternatives. Consequently, when there is no provision for the potential improvement of the people's financial conditions, socio-environmental conflicts tend to occur, contributing to a change in the livelihood strategies of displaced peoples. This tendency has resulted not only in environmental degradation, but also in the disruption of peoples' control over both natural resources and their livelihoods (Bidol and Crowfoot 1991).

In spite of what has been stated above, it should not be presumed that local peoples have entirely coexisted in harmony with nature or that they have always provided the best solution to environmental preservation of their regions. However, there is a gap between the theoretical basis of proposed 'environmental conservation' and the way it has been defined and applied in practice and the results achieved. As West (1991:xvii) states, 'the real tragedy is that, based on such [national park] definition alone, resident peoples in developing countries have been displaced or blocked from traditional uses of park resources and left to suffer severe deprivation and social impacts without any documented proof that they were harming the resources of the park'.

## 2.5 New Approaches to Environmental Conservation

The 1960's was a period of increasing mobilisation of civil society worldwide giving rise to popular campaigns and students mobilisations and criticising current behaviour and attitudes. These movements were fundamental to the appearance of a new environmental thinking in which living

standards and values of urban-industrial society was viewed as responsible for the homogenisation of cultures and nature disruption.<sup>13</sup>

Modern theoretical debate concerned with environmental conservation in protected areas has its origins in that period. The debate revolves around three major schools – deep ecology, social ecology and ecomarxism. Considering that nature should be preserved for its own sake independently of the contribution that protected areas would bring to human well-being, deep ecologists formulated their theory on an even more restrictive conception of nature-society relationship than the early preservationists. As Norton (1991:175) states, facing environmentalists failure to develop ‘a positive view of man’s role in nature’, deep ecologists ‘looked to the past and the revival of a humane, non-industrial ethic’.

These ideas were widely criticised by social ecologists who argued that deep ecologists neglected the fact that ecological problems were rooted in the social arena. Desegregating society into different groups, they criticised the existing institutional hierarchies and power relations within modern society, proposing more democratic structures based on decentralised and communal forms of production. In this respect, the form of interaction of ‘organic communities’ with nature was viewed as an example for a new society in which the technology would be available for its benefit and not for nature domination (Diegues 1994).

The interaction between nature-social relations was analysed in depth by ecomarxists who argued that the basic contraction within capitalist societies should also incorporate the existing contractions of historic and natural productive forces. This idea represented a critique on Marxist acknowledgement of nature as an object of consumption or simply a means of production, as well as its definition of ‘traditional’ societies as mere local humanity development and nature idolaters. In this respect, Moscovici developed three influential ideas concerning the appearance of a new naturalism: society is concomitantly the means of production and the product of nature; nature is part of human history; and society-nature relations are established collectively rather than individually. According to Diegues (1994:50), Moscovici evoked a ‘new utopian necessary to a change of current destructive society relationship with the nature through a new human-nature relationship in which division becomes unity’. Nature is not perceived as a uniform reality in perfect equilibrium but as a constant creation of diversity with which each culture and region will interact in a very particular way. He argued that protecting nature in parks isolated from human interaction might not strategically contribute to the establishment of a more harmonious society-nature relationship.

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<sup>13</sup> Following Leopold toughs, Rachel Carson published in 1962 *Silent Spring*, an influential critique of the United States agroindustry base – pesticides, arguing that control over the nature had been conceived under an arrogant understanding of nature existence for human benefit and convenience.

This period is also marked by an increasing reflection on the implications of early top-down conservationist approach on resident peoples livelihoods and growing awareness of major international environmental organisations such as the World Conservation Union – IUCN with regard to the positive role of traditional peoples in nature preservation. This shift in perception and attitudes culminated in the *1980 World Conservation Strategy* which emphasised the importance of linking protected area management with the sustainable economic activities of ‘traditional’ populations in developing countries (Wells and Brandon 1995:2).<sup>14</sup> As Diegues (1994:vii) notes, ‘deep knowledge of the ecosystem, long-standing sustainable management practices, dependence on the use of natural resources, ancestral territorial rights were recognised as important arguments to maintain and associate traditional communities with protected areas management’.<sup>15</sup> To achieve this objective, alternative categories and participatory approaches for protected area designation and management have been developed and adopted throughout the world.

## 2.6 Alternative Categories for Protected Areas Management

UNESCO’s *Man and the Biosphere Reserves Programme* launched in 1979, has been considered the first attempt to link protected areas with local social and economic development, emphasising the concept of buffer zones as an important strategy for the protection and management of environmentally sensitive regions (Well and Brandon 1995). The model comprises a protected core area surrounded by a buffer zone and then a transition area, enlarging the effective area of natural habitat while defining the access and use of natural resources. By providing a physical barrier to human encroachment into the strictly protected core zone, development activities involving local communities are intended to take place in the transition area while the buffer zone is limited to research, education, training, recreation and tourism.

Wells and Brandon (1995:25-7) have, however, observed that the results from two decades of programme have been ‘disappointing’. They stated that ‘most biosphere reserves have been superimposed on existing parks and reserves [while] the agencies responsible for the management of these areas have usually lacked the resources, inclination or ability to modify their management

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<sup>14</sup> Representing the views of the IUCN, WWF and UNEP.

<sup>15</sup> Recognition of the role and importance of ‘traditional’ knowledge and resource management practices in the preservation of environmentally sensitive regions designated as protected areas has significantly evolved in the last twenty years within contemporary environmental policy making. This recognition, however, does not emerge in a vacuum. The issue of how best to manage resource base towards the resolution of continuous socio-environmental conflicts has raised many debates within environmental development and conservation policies. As Ostrom (1990) states ‘some scholarly articles recommend that the state control most natural resources to prevent their destruction, while others recommend that privatising those commons will resolve the problem’. It has been argued, however, that neither the state nor the market has been uniformly successful in enabling individuals to sustain long-term productive use of natural resources. Meanwhile, there is an increasing recognition that ‘communities are the most appropriate unit to carry out natural resources restoration and care as they are capable of acting collectively towards common environmental interests’ (Leach et al 1997).

approach'. As a result, the programme has brought little change to resource management rationality.

Nevertheless, the influence of this concept culminated with 1985 IUCN comprehensive system of management categories for the world's protected areas (see Table 1 in Appendices 2). Each category presented detailed and specific management objectives, defining the acceptable level of human use and alteration permitted in the area. The appropriateness of this apparently inclusive system has also given rise to many debates throughout the world. As West and Brechin (1991:10) note, many conservationists and concerned groups have argued that the existing categories are 'an ideal, while the management practice of conservation remains a much more muddled affair'. According to the authors, the present over-use of 'national park' category in developing countries has deeply influenced and increased the complexity of resident peoples issues in spite of the existence of the IUCN detailed and comprehensive system.

On the other hand, many people have argued that the view of vast differences in the forms of protection among and within countries, the uniformity of nomenclature and criteria for protected area designation and management may well contribute to a strengthening of international communication and co-operation. According to McNeely *et al* (1990:61), the best answer to the dilemma of environmental conservation and resident peoples is to combine different categories of protected areas around established strict protected areas aiming at 'supporting among them the overall fabric of social and economic development'.

In spite of IUCN's 'wider' perspective, it is still unclear as to whether there has been a real political will and support towards the resolution of existing conflicts as well as the improvement of resident peoples' livelihood and control over natural resources. As Ostrom (1990:153) states, 'the presence of good rules does not account for appropriators following them'.

## **2.7 Participatory Approaches for Protected Areas Designation and Management**

Many governments and conservationist organisations have also adopted participatory approaches to protected areas policy aiming at understanding specific needs and interests of resident peoples, strengthening local institutional capacities as well as establishing a long term commitment, technical and financial support on their part for local development (IIED 1994).

Despite the diversity of schemes and contexts, 'participation' of local people in protected area designation and management has been defined and used in multiple ways. Examination of many participatory processes adopted in protected areas in Africa, Asia and Latin America has revealed that 'participation' has been widely promoted through the education of resident peoples with the intrinsic and real aim of reducing their opposition to outside defined schemes. Resident peoples have 'passively' participated as a means to an efficient implementation of previously defined

projects through the provision of information, labour, and resources. Consequently, this process has *de facto* not enabled any involvement in decision making and power sharing, which remains centralised and dominated by government and related conservationist organisations (West and Brechin 1991, IIED 1994). As Ghai and Vivian (1992:3) state, 'there has been much more attention paid to ways in which local people can be persuaded to provide necessary labour input into environmental projects designed outside the community than to ways in which grassroots initiatives, stemming from indigenous environmental concerns, can inform the development of more successful projects – or can supplement or even replace the project approach'.

Programmes on resource management, furthermore, have been elaborated and implemented under the perception of *what* resident peoples are, rather than based on a broader understanding of *who* they are. Resident peoples have usually been defined as a homogenous and unified group with similar aspirations, views and demands. This rhetorical approach has presumed the absence of any power relation and diversity of interests within the so-called 'community'. As Nelson and Wright (1995:15) state, 'too often homogeneity of interests is assumed, whereas an intervention, however 'participatory', will benefit some people while others lose out'. The lack of a deep understanding of local socio-economic structures and diversity of interests have usually resulted in tensions and conflicts within the group, disrupting social codes and the power of the existing collective forms of political representative, thereby undermining the real participation of the most excluded (Murphree 1993).<sup>16</sup>

This scenario illustrates the gap between the theoretical basis of proposed 'people participation' and its meaning and application in practice – the gap between institutional rhetoric and reality. It remains unclear whether these participatory approaches have contributed *de facto* to resident people's awareness and the strengthening of their role as potential conservators of their environmentally sensitive regions. Furthermore, it is questionable whether these participatory approaches in protected area policy have challenged top-down practices and power relationships between those who have been systematically excluded from the political arena and those who are more powerful.

Participation as has been promoted has not strengthened peoples' control over protected area designation and management. Conversely, it has not only indirectly involved resident peoples as objects in the political arena, but also undermined their self-confidence and potentialities as subject of a process of social change and environmental conservation.

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<sup>16</sup> Quoted in McNeely (1995).

### 3 POWER DIMENSIONS OF A POLITICISED ENVIRONMENT

Underlying the whole previously examined debate on the implications of development conservation rationality in resident people's livelihoods and environmental conservation in developing countries, is the role of power in conditioning patterns of nature–society interaction and control over natural resources (Descola 1996, Hannigan 1995, Bryant and Bailey 1997).<sup>17</sup>

Many authors concerned with political ecology have argued that environmental conflicts should be addressed not only as a neutral process amenable to technical management, but also as a complex political and economic processes which have impinged on existing social inequalities. According to Bryant and Bailey (1997:28), 'central to the idea of a politicised environment is the recognition that environmental problems cannot be understood in isolation from the political and economic contexts within which they are created'. This assumption has raised the notion of a politicised environment in which costs and benefits associated with environmental conflicts are unequally distributed among different social actors.

A similar debate has taken place among sociologists who argue that socio-environmental issues are dynamic and involve many social actors who may define, negotiate and construct it (Hannigan 1995). The social constructivist perspective to the nature of environmental conflict, therefore, refers to the outcome of a dynamic political and social process in which different actors interact in the public and private spheres for the negotiation and legitimisation of their environmental interests and claims. Power dimension in a politicised environment in this perspective is precisely the ability that each actor possesses in influencing and controlling his/her own interaction with the environment as well as the environmental interaction of other actors according to a range of specific and complex interests regarding the environment. These diverse interests may motivate the action of those actors who are involved towards the achievement of their supremacy over all other actors, which may represent a constraint to their objectives.

The concept of power in relation to a politicised environment has raised many issues. Bryant and Bailey (1997:39) argue that for a better understanding of the role that power may play in conditioning patterns of interaction between different social actors and the environment it is fundamental to address three interrelated questions: What are the various ways and forms in which one actor seeks to exert control over the environment of other actors? How do power relations manifest themselves in terms of the physical environment of other actors? How are weaker actors able to resist their more powerful counterparts? These questions are relevant as they contribute to

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<sup>17</sup> Although the issue of the environment and its relations to humans will be examined from the perspective of political ecology and sociology, it has taken place in many other disciplines, including philosophy, history and anthropology. As Descola (1996:12) argues, nature–human relations are 'the forefront of the public agenda, as the place of the environment in human affairs has become a major political and ethical concern of peoples and governments'.

understand of the nature and dynamics that constitute particular socio-environmental conflicts.

The livelihood of many resident peoples and mainly the poorest in environmentally sensitive regions is directly dependent upon the environment in developing countries. Disrupting their access to natural resources by the global political-economic system has represented their absolute exclusion and impoverishment. Government support for corporate-oriented interventions in environmentally sensitive regions 'traditionally' occupied has led to resident people's expulsion to ecologically marginal lands and systematic resource base degradation. As Redclift (1997) notes, where the environment in developing countries is above all a 'livelihood issue' then any change or more precisely conflict or degradation to that environment will inevitably affect the ability of different actors to have access to the main source of their livelihoods.

Indeed, the resultant unequal distribution of environmental costs and benefits among different social actors has directly reinforced existing social inequalities, increasing the vulnerability of those who have been affected by this political logic through their physical exposure to environmental changes. In this respect, it has been argued that socio-environmental conflicts concerning the control of natural resources have political and economic origins, which have been strictly related to the characteristics of their development models and widely influenced by the global economic order (Descola 1996, Hannigan 1995, Bryant and Bailey 1997).

The implications of the modernisation development model and protected areas paradigm on 'traditional' structures of resource management and nature conservation in environmentally sensitive regions in developing countries is analysed with regard to development and conservation processes facing the region of the Lençóis Maranhenses in Brazil. Before proceeding to this analysis, it is important to examine how resource management *rationality* and the United States environmental movement have influenced conservationist policies in Brazil. Examining the political approaches for protected area designation, these issues are further investigated focusing on the socio-economic dynamics and environmental particularities of the selected case study.



## **THE REGION OF THE LENÇOIS MARANHENSES, BRAZIL**

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With the objective of contextualising the previous theoretical debate, this chapter examines the political background of the first protected area established in Brazil. Focusing on the region of the Lençóis Maranhenses, it presents the designation process of the Lençóis Maranhenses National Park and the APA Pequenos Lençóis, the regional socio-economic dynamics, the interaction between resident people's livelihood and nature and the government proposals for its economic development.

### **1 PROTECTED AREAS DESIGNATION IN BRAZIL**

Environmental conservation by means of protected areas has been the major approach adopted by Brazilian policy makers for environmental care. The first Brazilian Conference on the Protection of Nature took place in 1934 and in the same year the Brazilian Forest Code was launched introducing the concept of protected area (Hall 1997:53). Deeply influenced by the United States national park principles, the Code defined that extensive areas with outstanding scenic attributes would be delimited and preserved for urban population enjoyment, scientific research and environmental education while human occupation and exploitation of its natural resources would be prohibited.

Protected areas designation in Brazil has similarly been designated in a context of environmental disruption related to rapid urbanisation and large-scale development schemes. As Hall (1997:52-3) notes, the period 1930–64 was marked by the 'rapid rise of governmental sponsored industrialisation, which placed a strong priority on the exploitation of natural resources ... through state monopolies'. Nature was viewed as non-scarce, offering 'an infinite supply of physical resources for economic development'. In spite of this political disregard for natural resources, there was some recognition for 'the need for some form of environmental protection'.

Examination of sequential localisation of Brazilian protected areas reveals that their creation started in the industrialised Southeast-south region. It is precisely in the states of São Paulo, Minas Gerais and Rio de Janeiro, the most populated and urbanised regions, that the first Brazilian national park, Itatiaia, was established in 1937 by the federal government.<sup>18</sup> It was only from the 1960s, due to the expansion of urbanisation and agricultural frontier to the hinterlands and Amazonia leading to its rapid deforestation, that protected areas were created in other regions (Diegues 1994).

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<sup>18</sup> Between 1937 and 1959 six national parks were created, two in the Southeast, two in the South, one in the Centre and one in the Northeast region (IBAMA 1989).

In fact, most protected areas were established in the period of military dictatorship (1964–86) when an aggressive policy for promoting national integration and economic development was established. According to Diegues (1994), two major factors lead to a systematic implementation of protected area policy. The first was the pressure of international organisations such as the World Bank and Inter-American Development Bank which began to include environmental protection clauses as a condition of loans for large development schemes.<sup>19</sup> The second concerned the Military’s interest in Brazil’s sovereignty and national security through the occupation and development of frontier regions. As Hall (1997:53-4) states, environmental protection through ‘centrally controlled conservation units’ was viewed by the militaries as a strategy for ‘developing a strong federal focus from which to direct the nation’s modernisation process and place political control at the centre’.<sup>20</sup>

**1.1 Government Environmental Policies and Resident Peoples**

The United States experience has not only influenced the concept of protected area but Brazilian environmental policies as a whole. These have been marked by development *rationality* and conservative vision regarding resident peoples and ‘traditional’ resource management practices.

During early *frontier* development conservationist policy, little or no attention was given to resident peoples. Thus the fact that their livelihood was directly related to the management of natural resources was disregarded. As Diegues (1994:2-3) notes, protected areas were designated ‘in a top-down manner, without consulting the regions involved or the populations whose way of life would be affected by the restrictions imposed on their use of natural resources’. Local populations and their ‘traditional’ economic activities were *de facto* perceived as obstacles to government development conservation strategies and centralised policy making (Hall 1997).

Establishment of the Brazilian Institute of Forest Development – IBDF in 1967, the former federal environmental agency responsible for protected area policies will characterise Brazilian ‘paradoxical’ conservationist policy. In fact, IBDF was simultaneously involved in the deforestation of large areas and in projects of reforestation for industrial-oriented proposes.<sup>21</sup>

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<sup>19</sup> This period coincided with the growth of Brazil’s foreign debt and consequent soliciting for large loans for the viability of mainstream development policies.

<sup>20</sup> Governmental organisations and ambitious programmes were established and economic development strategies were designed for attracting and ‘benefiting’ hundreds of thousands of Brazilian rural landless to frontier regions such as Amazonia. These programmes, however, neglected to address their social and economic demands, being official subsidies offered to stimulate speculative large-scale commercial production such as logging and cattle ranching without any restriction. Consequently, its policy led not only to violent social conflicts on resource base and deforestation, but also to the disruption of traditional peoples access and management to natural resources deeply affecting their livelihoods and environmental integrity (Hall 1997).

<sup>21</sup> In 1989, the IBDF was absorbed into the new environmental federal agency, IBAMA together with the three other major Brazilian environmental protection agencies: SUDEPE, SEMA and SUDHEVEA (Hall 1997:56).

In addition, the government's environmental policies have been marked by a 'defeatist' position in which only some 'primitive' regions under special protection can remain in the long-term in the view of human growth and technological development (Diegues 1998). This statement is well illustrated by the Brazilian Plan for Protected Areas System which was launched by IBDF in 1979, with the main objective of carrying out a detailed study on the regions defined as priorities to the designation of new protected areas. The Plan was also intended to review the unique two existing management categories – national park and biological reserves. Many authors have, however, stated that the improvement of protected area management categories was never enforced by subsequent legislation (Hall 1997, Diegues 1994). The Brazilian Institute of the Environment and Renewable Resources – IBAMA was created in 1989, recommending a reevaluation of the 1979 Plan to a non-governmental organisation, Funatura. It's final document states:

'Human occupation of the Earth has increased greatly throughout this century. This is due to an inevitable and non-controlled demographic expansion and rapid technological development. As a consequence, it may be that the last primitive regions of the planet will be those submitted to special protection regimes'. It concludes by stating that 'the most efficient and unique way of reducing this irreversible impoverishment, is the establishment of a series of protected areas. This should be based on broader planning according to scientific criteria which would protect a large number of animal, vegetation species and existing ecosystems.

Throughout the document there is no reference to resident peoples and 'traditional' resource management systems. Conversely, as Diegues (1998:118) notes, this document represents 'the loss of a historical opportunity' to review protected area management categories towards contextually suitable and realistic development conservationist policy for environmentally sensitive regions in Brazil and, to some extent, in developing countries.

These government approach as were later challenged by José Lutzenberger, one of Brazil's most distinguished environmentalists, who was appointed as the Secretary of the Environment by the newly democratically elected president Collor in 1990. As Hall (1997:59) states, rejecting technocratic and large-scale development paradigms, Lutzenberger will promote a radical shift in previous conservationists policies by acting on illegal forest burning, incorporating local peoples into the formulation of public policy and setting up a new institutional framework for environmental policy. His vision, however, directly conflicted with the interests of powerful timber industries and politicians who were in favour of regional 'modernisation' and 'economic growth' which was facilitated by IBAMA. Lutzenberger was replaced after the 1992 Rio Summit.<sup>22</sup>

The complexity and socio-environmental implications of Brazilian development and conservation policies in 'traditionally' occupied environmentally sensitive regions are further analysed in chapter three. Before proceeding to this analysis, this chapter contextualises this debate

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<sup>22</sup> According to Hall (1997: 60), the divergences and conflicts between Lutzenberger and corporate-political groups was set aside temporarily as Brazil hosted the 1992 UNCED.

by presenting the designation process of the Lençóis Maranhenses National Park and the APA Pequenos Lençóis, the regional socio-economic dynamics and government proposal for its economic development and environmental conservation.

## 2 THE STATE OF THE MARANHÃO

### 2.1 Natural and Human Geography

Amazon rainforest, *cerrado*, semi-arid, mangroves, rivers, dunes and *babaçus* reserves are some of the ecosystems which compose the Maranhão.<sup>23</sup> The state is situated in the Northeast of Brazil, presenting the biggest area of mangroves and the major diversity of ecosystems of the country as well as the major hidrographic basin of the Northeast region– NE.

The mix among indigenous people, Africans and Portuguese, deeply characterise the faces, culture and livelihood of the great majority of the Maranhão's population. The state has a population of 5,222,183 inhabitants with an average of 4.7 persons per household. According to the last census carried out by the Brazilian Institute of Geography and Statistics – IBGE (1996), there is a comparative rise in the urban population of the state from 40,01 percent in 1991 to 51,92 percent in 1996, leading to a process of urbanisation.<sup>24</sup>

In urban areas, 83,7 percent of children from seven to fourteen go to school in comparison with 76,0 percent in rural areas; 77,9 percent are girls and 74,3 percent are boys, following a tendency in the NE. Illiteracy among adults is 56,7 percent. Maranhão is also characterised by its high levels of migration within, from and to other states, mainly the NE.<sup>25</sup>

Its six hundred and forty kilometres of littoral, the second biggest of Brazil, is characterised by an impressive landscape of ten of small bays and islands, *Reentrâncias Maranhenses* in the west and the unique open sea delta of the whole America, *Delta do Parnaíba* in the east. Between them, extraordinary ecosystems of dunes, mangroves, *igarapés* (narrow riverbanks), *restingas* (sandbank) and lagoons compose the region known as the Lençóis Maranhenses, comprising approximately thirty thousand inhabitants spread in 264 localities.<sup>26</sup>

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<sup>23</sup> Maranhão has a land surface of 333,365,6 square kilometers. Its limits are the Atlantic Ocean (N); the state of Piauí (E); the state of Tocantins (S) and the state of Pará (W).

<sup>24</sup> Nevertheless, the state continues far from below the average of urban population of the Northeast region of 65,21 percent and of the national of 78,36 percent (IBGE 1996).

<sup>25</sup> This fact was observed during the census when it was stated that 72,97 percent of the population migrated within the state from 1991 to 1996. In addition, it was shown that the population was decreasing 1,18 percent per annum due to a decrease in the fecundity level, and the migration to other states, searching for employment (IBGE 1996).

<sup>26</sup> Considering a zone of influence of 3,5 kilometres around the Park and the APA perimeters from Primeira Cruz to Paulino Neves. This information is based on a comprehensive map developed by D'Antona (1997:227-31), using as reference the combination of many sources as the IBGE map (1979), scale 1:100,000, sheets Boa Vista (496), Barreirinhas (552), Humberto de Campos (551), and LANDSAT satellite image (1993).

### 3 THE REGION OF THE LENÇOIS MARANHENSES

#### 3.1 Ecosystems

A hundred and fifty thousands hectares of white sand dunes, the Lençóis Maranhenses is characterised by a rare geologic formation of dunes, which are constantly moving and reshaping themselves driven by the sea winds and watercourses. Through this movement, the dunes have been slowly expanding towards the continent.

This apparent arid ecosystem comprises three major ecosystems. One is the *cerrado* which contours the dunes, the other is the *restingas* in the area of the dunes and the third is the mangroves in the margins of the Preguiças River (UEMA 1996). It also represents the habitat of many endangered species<sup>27</sup> as well as the support to thousands of migratory birds<sup>28</sup> and many sea turtles<sup>29</sup> that use the environment to lay their eggs (IBAMA 1997).

The region is marked by two main seasons due to the proximity with the equator: the winter from January to June and the summer from July to December. In the winter, the water from the rain fills up the rivers, creating tens of thousands of lagoons while the sea winds drop and the sea becomes calm.<sup>30</sup> During the dry summer, the lagoons evaporate and the sea becomes turbulent.

The uniqueness of the regional environment and the majestic contrast of the white dunes with the green and blue lagoons of crystalline water formed by the rainfall has been regarded as one of the major 'patrimony' of the region of the Lençóis Maranhenses, resulting in the establishment of the National Park.



Lençóis Maranhenses National Park, 1999

<sup>27</sup> Such as peixe-boi-marinho (*Trichechus manatus*), veado mateiro (*Mazama americana*), paca (*Agouti paca*) and jacutinga (*Penelope sp.*).

<sup>28</sup> Such as trinca-reis-boreal (*Sterna hirundo*), masarico rasteirinho (*Calidris pusilla*) and marrecas de-asa-azul (*Anas discors*).

<sup>29</sup> Such as tartaruga verde (*Chelonia mydas*), tartaruga comum (*Lepidochelys olivacea*), tartaruga de pente (*Eretmochelys imbricata*) and tartaruga de couro (*Dermochelys couriácea*).

<sup>30</sup> During the winter season, the pluvial metric level of the region steadily increases achieving a rainfall precipitation of more than sixty percent of the total 1,600 mm annually (UEMA 1996).

### 3.2 Limits and Objectives of the National Park and APA Pequenos Lençóis

The Lençóis Maranhenses National Park was launched in 1981 by IBDF aiming at 'protecting the flora, fauna and the existing local natural and scenic beauties' for scientific, educational and recreational use (Article 2, Decree 86,086 – 02/06/81). Its perimeter is defined in Article 1, as follows:

'It starts in the point of geographic co-ordinates: Latitude 02°39'29"S and longitude 43°11'42"W Gr., localised in the telegraphic network alignment which connects Humberto de Campos and Barreirinhas, point 1. Proceed north in a straight and dry line until the point of geographic co-ordinates: Latitude 2°30'00"S and longitude 43°11'42"W Gr., point 2. Inflect north-westward through other straight and dry line until the point of geographic co-ordinates: Latitude 2°22'03"S and longitude 43°25'34"W Gr., localised in the intersection of the previous line and the septentrional part of the Santaninha Island, point 3. Contour south-westward until the point of geographic co-ordinates: Latitude 2°33'11"S and longitude 43°27'56"W Gr., point 4. Enter perpendicularly one kilometre into the Atlantic Ocean contouring the littoral in a clock wise direction until the point of geographic co-ordinates: Latitude 2°33'50"S and longitude 42°45'00"W Gr., point 5. Follow through the carriageable road which connects Ponta do Mangue and Barreirinhas until the point of geographic co-ordinates: Latitude 2°44'39"S and longitude 42°51'11"W Gr., localised in the insertion of this road and the telegraphic network, point 6. Proceed north-westward until the point 1 described, enclosing the perimeter'.<sup>31</sup>

As stated by IBAMA's official in São Luis, many of these limits followed routes and marks already demarcated by the Petrobrás, which tried unsuccessfully to drift for petrol in the region.<sup>32</sup> According to IBAMA's administrator in Barreirinhas<sup>33</sup>, the designation of the Park had more to do with Floralim Coelho initiatives, a state representative of IBDF in 1981, than any detailed ecological study. In Coelho's own words:

'The idea of the Park was raised in 1973-4, when we carried out a research on the natural resources of the coastal areas of Maranhão to the Programme of National Integration of the Ministry of Mines and Energy... Later on, taking advantage of my investiture as IBDF Delegate, we justified and struggled for the creation of the first and unique National Park in Maranhão, negotiating with closer staff in IBDF Central Administration... Following other parks, which present rare beauty scenic and unique ecosystems, the objectives were publishing, study and protect these privileged environments... The delimitation of a protected area is based on many criteria: from the strategic point to be conserved such as existent natural affluent, demographic boundaries, relief and vegetation, to the facility of demarcation of the area... It was not planned and happened any expropriation in the area, due to the non-interest in the natural aspect of the sandy soil and the *restinga* which are economically non-viable'.<sup>34</sup>

Nevertheless, while the dunes, lagoons, *cerrado* and *restingas* were protected within the boundaries of the Park, important ecosystems remained totally away from its perimeter. Only ten years after the creation of the Park, the mangroves situated of the mouth of the rivers Preguiças

<sup>31</sup> According to the division of the Maranhão in twenty one homogeneous regions, the Park is part of the *Microregião 04* which is composed by the municipalities of Barreirinhas, Humberto de Campos, Primeira Cruz, Santo Amaro do Maranhão and Tutóia (IBGE 1994). Translated by the author.

<sup>32</sup> Established in 1953, the Petrobrás will become a major governmental monopoly of petrol and natural gas in thirty years.

<sup>33</sup> Since 1989, IBAMA has been responsible for the management and fiscalisation of the Park and later of the APA while the State Adjunct Environmental Administration – GAMA has a supplementary role such as the approval of enterprises in the region. GAMA's lack of resources, however, has given to IBAMA a major role of direct actuation, which is well illustrated by the unique government representation in the region, IBAMA Post of Control and Fiscalisation – POCOF in Barreirinhas.

<sup>34</sup> Quoted in D'Antona 1997:155 and translated by the author.

and Parnaíba and their ciliary vegetation, were designated by IBAMA as APA Pequenos Lençóis.<sup>35</sup> It is important to emphasise that this time Lutzenberger was in charge of environmental policies in Brazil and whose challenging position could be seen in the adoption of an alternative protected area category – APA, focusing on resident people's integration with nature conservation. The APA's main objectives are:

'To discipline the process of land occupation and promote natural resources protection within its limits in order to secure the well-being of resident populations by conciliating human actions and wildlife preservation, natural resources protection and improvement of quality of life of the population' (IBAMA 1999).

### 3.3 Seasonally and Diversification of Regional Social and Economic Activities

The livelihood of the great majority of resident peoples in and around the boundaries of the Park and the APA are also subject to changes of the season. The rainfall defines the seasons and emphasises the socio-economic activities through their physical or representative displacement: winter fishing in the littoral, summer farming in the countryside. In this temporal process, many people (men alone or with the families) from the countryside go fishing in the littoral during the winter and vice versa during the summer. Other families remain in the same place carrying out their respective activities.

This seasonal socio-economic dynamic was clearly observed in Atins, when a relative of the family in whose house the author stayed, came from the countryside. He brought cassava for his relatives and during four days went fishing with the fishworkers of the family. According to them, every year during this period he goes to the littoral bringing some product from the countryside and then returning to his village with the salted fish.

This characteristic process is complemented by other typical regional activities such as the extraction of Buriti palms and mangrove trees, collecting crab, cattle raising and pottery. All these activities together have created a complex livelihood network, as it is presented.

#### Artisanal Fishing

From observation, the practice of fishing could be divided into three main categories: artisanal, on board and commercial.

Artisanal fishworkers mainly in Atins, Mandacaru and Caburé go fishing one or more times per day using nets from 30 to 200 brace – *capoeiras* either 'pulling the fish with the hands' through the littoral or in canoes in the sea and in the mouth of the Preguiças River. Some of them also spend up to twenty days in the sea in sailing canoes. The owner of the canoe establishes a partnership

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<sup>35</sup> The APA 'is localised in the Maranhão's oriental littoral of the mouth of the river Preguiças to the mouth of the river Parnaíba, including the municipalities of Barreirinhas, Tutóia e Araióses. Its co-ordinates are 2°33'50" and 2°55'00" latitude south and 41°51'00" and 42°51'11" latitude west, occupying a total area of 249,684,3 hectares' (Decree 11899 – 15/06/1991).

with other fishworkers that do not have a canoe or rent it to them on an economic basis of division of the related fish trade.<sup>36</sup> Due to the great distances and difficulty of access to consumption centres, the fish is normally sold directly to intermediaries in Atins and Barreirinhas. Artisanal fishing is basically a male activity (mainly when they spend long periods in the sea), although many women go fishing with their husbands or colleagues because they enjoy or are alone.<sup>37</sup> This activity involves all the family such as girls that due to their delicate fingers normally twist the nets while fishermen are responsible for fixing them after fishing.



Artisanal fishworkers, Atins, 1999

Since the 1960s, many commercial companies from the states of Ceará, Piauí and Pará have introduced into the littoral of the Maranhão powerful motorised boats equipped with draw-nets to catch shrimp. This practice is legally permitted ten miles (18,52 kilometres) from the Brazilian coast, being strictly prohibited near the littoral, as the draw-nets drag tens of thousands of small fishes to the bottom of the sea thereby destroying its maritime flora and fauna.<sup>38</sup> These companies, however, have systematically been catching shrimp less than a hundred metres from the coast,

<sup>36</sup> Fifth percent to the owner of the canoe and fifth percent to the embarked fishworkers. The surplus is commercialised either fresh (more valorised and expensive) or salted.

<sup>37</sup> In both periods, 1997 and 1999, it was observed many canoes in the Preguiças River with a man and a woman fishing. This was one of the reasons why the issue was brought into discussion during the field research, when many women declared their involvement in the activity due to the reasons aforementioned. Based on this context, it was chosen the term fishworker rather than fishermen/women, in coherence with the proposal of this study.

<sup>38</sup> It is known that for each kilo of 'draw' shrimp, ten kilos of fish is deteriorated and lost.



causing many accidents with the nets and canoes of artisanal fishworkers, and seriously damaging the local maritime environment (IBAMA 1998).

For the 'traditional' populations, during the summer the activity is basically limited to the coastal fishworkers, who remain fishing mainly near the coast and in the river. It is also at this time that the great majority of riverine producers start to cultivate their yards or plantations to grow one of the most significant subsistence products of the region: the manioc.

### **Agriculture**

Tapioca, cassava and other manioc derivate together with fish have been historically the main diet of the coastal population throughout Brazil. The techniques adopted to cultivate and extract products from the manioc are part of one of the most genuine heritage of the indigenous culture (Holanda 1995). The high production of the riverine villages in the countryside provides the bulk of the food for the producer family with its surplus distributed to other localities and coastal populations. According to D'Antona (1997:90-3), the manioc is manually cultivated with no mechanic equipment, using very low levels of chemicals in the whole process, and processed near the houses.<sup>39</sup>

Another typical product of the regional economy is the Cajun. According to some authorities in Barreirinhas, the Cajun-nut is the most important source of income of the municipality. The fruit is native 'growing in the sand' as a 'wild fruit' and extracted in combination with other subsistence activities in a family-based system. In spite of its economic potentiality, there is no great interest in its pulp due to its low profitability because of the precarious conditions of the collection, storage and physical access to markets. The town does not provide any assistance to develop the Cajun-nut industry. Consequently, it is sent *in natura* to other states.

### **Extracting**

The vegetal extraction of the palms of Buriti, Babaçu, Carnaúba and mangrove trees can be seen everywhere, in the structures of houses and boats, bridges, stakes and fences, walls and roofs, furniture, fishing basket, food, sweets and oils, clothes and handicraft.

The division of activities and use of the palm tree are well defined. The trunks are used by men for building houses and boats, the eyes are used by women for handicraft, the leaves collected by children for making roofs and the fruits are manipulated for everyone. According to Carvalho (1986:44), the handicrafts made by women with the palm of Buriti and Carnaúba are fundamental to complement their economic activities, contributing to women 'active participation in the

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<sup>39</sup> The whole process is operated on a barter system without the use of money. In the case of producers that do not have the appropriate equipment to process their own manioc, they use those of their neighbours, paying the owner with part of his/her production.

cultural regional process, as they periodically sell their products and buy basic items in Barreirinhas. Since the 1970s, however, the handicraft has passed from subsistence to a commercial activity by replacing utilitarian handicrafts by industrialised products. This has contributed to the loss of its traditional basis and, consequently, to the overuse and increasing degradation of the resource base (Carvalho 1986).

### **Cattle Ranching and Pottery**

These complex livelihood strategies are complemented by two other related economic activities: cattle ranching and pottery.<sup>40</sup> These activities are part of a diverse regional economic system, as they require capital and the contraction of paid workers, and are directly dependent on the market. There are not family-based subsistence activities as previously described. The pottery production, as described by D'Antona (1997:99), has two levels the familiar which is developed in the yard requiring few people and small quantity of material, and the commercial which requires more space, people and material. In the familiar scale the area used is later recovered through the deposition of organic rubbish and the cultivation of trees and vegetable-gardens while in the commercial scale the area is in continuous expansion resulting in large cavities which are left unused.

### **3.4 Networks – Preguiças River, Barreirinhas and Caburé**

More than a geographic reference, the Preguiças River is a fundamental part of these complex socio-economic livelihood strategies within the region. Above its calm waters, the littoral and the countryside meet each other through the dislocation of people, products and information. The river is also part of the daily activities of the riverine populations. They use the river for fishing, collecting crabs, extracting wood, cooking, sleeping, bathing, swimming, leisure and litter.

The most 'significant harbour' of this constant movement is Barreirinhas, the capital of the region, where the majority of regional services and institutions such as the local government, the federal bank, the hospital, the high school, the post office, the market and IBAMA's post are to be found. It is in Barreirinhas that the salted or fresh fish, the manioc, the Cajun-nut, the handicraft, the crab, the brick and the tile are sold, bought or exchanged every day.

It is also from Barreirinhas that people travel up the river towards Caburé, a sandbank at the mouth of the Preguiças River near the fishing villages of Atins and Mandacaru. Because of its favourable location between the river and the sea the fishworkers have developed a particular

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<sup>40</sup> These activities were explained by a former cattle rancher, who now lives in Atins constructing canoes and by a fisherman who owns the house in Atins, where the author stayed. The later moved from Laranjeiras to Atins, stating that he bought the tiles of his house in 'my village Laranjeiras'. These activities are confirmed by other aforementioned studies.

relationship with Caburé where they go fishing in the winter and are called by the locals 'nomads' from the countryside. Caburé has attracted not only fishworkers, but also entrepreneurs and tourists. This new economic activity has increased since 1992, when the first guest house was built in the area, marking the beginning of a rapid process of structural social change which to some extent is spreading to the coastal region as a whole.



Barreirinhas



Preguiças River



'Nomads' near Caburé, 1999

### 3.5 Future Proposals: The 'Tourism Road'

The consolidation of tourism as an 'economic alternative to poor populations' is one of the major policies of the state government for the region of the Lençóis Maranhenses. The policy is called Action Programme for the Development of Tourism – PRODETUR II.<sup>41</sup> According to the manager of the State Tourism Sub-administration – GETUR, 'having a landscape of outstanding beauty and its inestimable natural and cultural resources' the region has 'a major asset for the development of tourist products such as the ecotourism'. In line with the national Programme for tourism development in the NE, PRODETUR – NE's main objectives are:

'To implement a programme of investments towards the development of an important regional economic segment, guaranteeing the improvement of resident population's quality of life and promoting the preservation and maintenance of the existing ecosystems' (Maranhão 1999).<sup>42</sup>

Based on the results of previous experiences throughout the NE the Programme has, however, been widely challenged for its practical application and criticised by many academics concerned with the impacts of tourism on local development and environmental conservation. Emphasising the profound and negative socio-environmental impacts of the programme on many NE coastal regions, Rodrigues (1999:156-8) argues that 'the tourism model proposed by the PRODETUR – NE reproduces neoliberal paradigm centralised in a corporate hegemonic capitalism, excluding local populations by disregarding not only conjectural, but mainly structural social demands'.<sup>43</sup>

<sup>41</sup> The programme also includes the region of the Delta do Parnaíba, comprising a total area together with São Luís of 26,120,3 square kilometres with 1,129,705 inhabitants (Maranhão 1999).

<sup>42</sup> In this respect, the first step adopted was 'the regional division of the state in poles of interest according to local homogeneity and attractive proximity'. The first phase of the programme (PRODETUR I) focused on investments in infrastructure in the Historic Centre of São Luís, which is considered the 'state centre receptor of tourism' (Maranhão 1999). Translated by the author.

<sup>43</sup> The Programme is supported by the IDB, Sudene, Embratur and BNB (Rodrigues 1999:159).

In this respect, according to Rodrigues (1999:18), rather than environmentally friendly, the Programme has promoted profound environmental problems, including the ‘dismount of mobile dunes for the building of hotels and secondary housing... As a result, this process has dramatically altered local ecological equilibrium, changing the dunes direction towards the existing localities and even the new buildings’. Thus, rather than developing economic alternatives for the local population, the majority of tourism infrastructure has been ‘artificially’ created, neglecting the local cultural and environmental particularities and instead promoting socio-physical segregation between the resident people and tourists.

Nevertheless, the PRODETUR II was recently launched in the Lençóis Maranhenses with the construction of the ‘tourism road’, the MA– 402. According to the manager of the GETUR, this new road will bring a regional economic alternative by improving people’s access to São Luis throughout the littoral. Indeed, the region is characterised by its ‘isolation’ and scarce alternative access to São Luis. Barreirinhas is currently connected to São Luis only through the roads BR–135 and BR– 222, a total 337 kilometres, of which 145 kilometres are non-paved (MA– 025).<sup>44</sup>

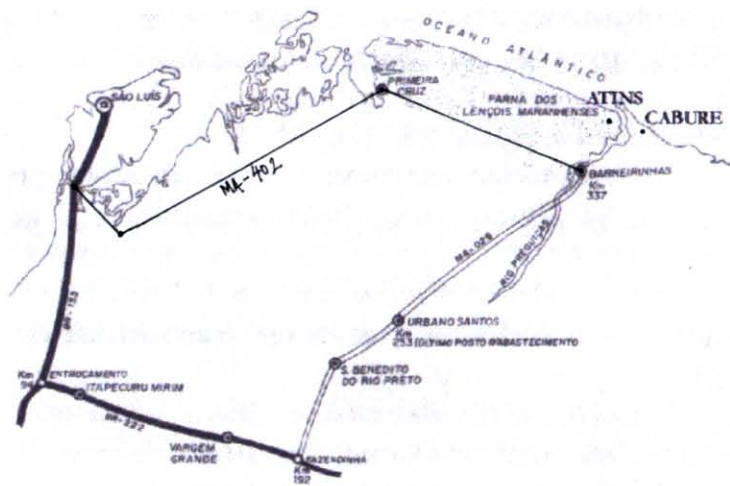
The implications of these economic development and conservationist policies in resident peoples’ livelihoods and environmental sustainability are further analysed in the context of the theoretical debate.



BR – 222



MA – 025



Schematic localisation of the MA– 402, Atins and Caburé indicated by the author.

<sup>44</sup> For the majority of the local population, it means travelling ten hours by bus or seven hours by a four-wheel Toyota vehicle when the MA– 025 is not full of lagoons.

## IMPACTS OF DEVELOPMENT AND CONSERVATION POLICIES ON RESIDENT PEOPLES LIVELIHOODS AND ENVIRONMENTAL CONSERVATION

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Using as a framework the theoretical debate previously examined and the case study presented, this chapter analyses how the designation of the Lençóis Maranhenses National Park and the APA Pequenos Lençóis have affected resident peoples livelihoods and related regional environmental sustainability. Underlying this analysis, it brings into debate the power relations behind the adoption of dominant development conservation *rationality*.

First, it examines the political and economic interests behind the designation of the Park and the APA. Focusing on the discourse and practice of IBAMA and on Atins inhabitants' perceptions of environmental conservation, it analyses the impact of conservationist policies on resident people interaction with nature. Finally, it examines the government's future proposals for regional development, questioning the appropriateness of the adoption of prevalent economic development and protected area paradigms in environmentally sensitive regions in developing countries.

### 1 POLITICAL AND ECONOMIC INTERESTS BEHIND THE DESIGNATION AND DELIMITATION OF THE LENÇÓIS MARANHENSES NATIONAL PARK

Established during a period of strong government incentives for national integration through large-scale infrastructure and frontier occupation, the Lençóis Maranhenses National Park is the result of *reactive* environmental policy towards the protection of large stocks of natural resources from its own economic development paradigm (Nash 1989). Following the United States experience, its designation represents a *standardised* conservationist paradigm. This is notable for the absence of wider socio-ecological criteria informing nature protection as well as the disregard for the improvement of resident peoples livelihoods and the strengthening of sustainability in the existing socio-economic dynamics (Norton 1991, Diegues 1994).

This government approach has not only promoted tensions between the resident people livelihood and protected area paradigm, but also reinforced the legitimisation of social exclusion and environmental disruption under the rhetoric of nature protection (Sellars 1997). In fact, the designation process of the Park has brought into the scene diverse political and economic interests shifting the patterns of local nature–society interaction and, therefore, configuring a complex politicised environment (Bryant and Bailey 1997, Hannigan 1995).

It is worth noticing that although the region of the Lençóis Maranhenses did not represent an axis of urbanisation according to military development *frontier* logic, the designation process of the Park started after Petrobrás' unsuccessful attempt to explore for petrol in the region. Whether the

firming of the designation process of the Park was due to the unsuccessful activities of Petrobrás reveal unclear, the context which it was established illustrates the presence of intrinsic political-economic interests in natural resources, rather than in nature conservation *per se*.

In fact, the Park was 'coincidentally' established in the 'non-economically viable' area of the dunes, while other potentially attractive areas for economic development were 'not protected' such as the fragile mangroves and the ciliary vegetation of the Preguiças River, from where a great part of regional resources are extracted. Furthermore, the government's *discourse* of 'protection of flora and fauna' contradicts the Park's perimeter based on rigid references such as 'a straight and dry line', 'through the carriageable road', 'enter perpendicularly one kilometre', illustrating political disregard for local ecosystem particularities.<sup>45</sup>

Behind these criteria can be observed the government's strategy of non-intervention in local agrarian structure and its related omission from the future process of speculation and consequent environmental disruption and expulsion of the resident peoples. This trend is confirmed by the absence of government policies to regularise land tenure of resident peoples while local oligarchy have acquired those economically viable lands 'traditionally' occupied and now favoured by tourism development policies.

This challenges Floralim's testimony stating the objectives of the Park, including 'publishing, study and *protect* these privileged environments' and 'the *non-expropriation of resident peoples*' due to the '*non-interest* in the natural aspect of the sandy soil and the vegetation which is economically non-viable'.<sup>46</sup> Indeed, it could be stated that behind political rhetoric of 'environmental protection', the designation and delimitation of the Lençóis Maranhenses National Park represent a process of government and local elites control over natural resources.

As part of environmental policies leading by Lutzenberger, the later APA designation tried to challenge these political-economic interests through the adoption of a wider protected area concept and alternative category of resource management. The APA represents a comprehensive socio-ecological perspective, struggling for the affirmation of resident people's positive role in environmental conservation. However, as it was previously examined, reproducing Leopold's trajectory, this unprecedented step in Brazilian conservationist policy was deeply constrained by powerful political interests and corporate pressures, ending up in Lutzenberger's displacement and, consequently, the return to a more conservative ecological vision and top-down power relations in resource management (Nash 1989). One of the most significant results of this legacy is the adoption of a restrictive and punitive environmental policy systematically implemented over those

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<sup>45</sup> Mentioned in the Decree 86,086.

<sup>46</sup> Italic added by the author.

who have been continuously kept outside the mainstream political sphere (West and Brechin 1991, Diegues 1994, Wells and Brandon 1995).

## **2 IMPACTS OF PROTECTED AREA PARADIGM ON RESIDENT PEOPLE'S LIVELIHOODS AND REGIONAL ENVIRONMENTAL CONSERVATION**

The regional economy and livelihood of most 'traditional' resident peoples have been marked by a complex socio-environmental dynamic based on extended-family strategies and on the exchange of a dimension of products. This has resulted in the diversification of small-scale activities, such as 'artisanal' fishing, agriculture, extractivism, pottery and handicraft. Resident people's particular relationship with their locus could represent an example of significant local knowledge on nature and its seasonal cycles through a limited interference in the carrying capacity of resources base and fundamentally to the sustainability of their livelihood (Berkes 1999). It could, therefore, be stated that this dependent but positive relation of this 'artisanal' economic system with regional environmental conservation has been characterised by a mutually reinforced relationship considered by many authors as the basis of a 'sustainable' human-nature interaction (Wells and Brandon 1995, Diegues 1994).

Power relations behind the designation of the Park and the APA combined with the incorporation of commercial forms of resource management such as draw fishing have deeply affected the basis of this complex regional economy, resulting in structural transformations of 'traditional' forms of production (Diegues 1998). These impacts were clearly observed during the discussion about local people's perceptions of environmental conservation in Atins.

### **2.1 Local People's Perceptions of Environmental Conservation**

Environmental conservation was not spontaneously debated in Atins. It was observed that although environmental degradation was not part of their daily vocabulary, their livelihood was directly associated with levels of natural resources consumption. These they generally divided into three groups of actions: environmentally disruptive actions that should be totally avoided as draw-fishing; non-damage actions as 'artisanal' fishing; and inevitable but not intentional actions as the collection of mangrove wood. The differentiation between environmental preservation and livelihood appeared under the notion of 'natural resources scarcity' and totally related to commercial draw fishing companies from Barreirinhas and other states 'responsible for the destruction of the littoral'. It was also due to IBAMA punitive attitudes over their daily activities which have been 'profoundly interfering' with their lives.

It is in this context that many fishworkers in Atins used the expression 'artisanal' to differentiate their subsistence practices from those fishing activities realised on a profitable basis. According to a fisherman:

'Until twenty years ago it was not necessary to go far away to fish, everything was here in the littoral... Since the 1970s, when the motorised boats started drawing shrimps, the fish has disappeared forcing us to spend two or more weeks in the sea trying to fish for our families survival'.

The relationship between Atins and Caburé may also illustrate the implications of protected area paradigm on the local people's ability to control the resources (Bryant and Bailey 1997). Since the establishment of the first guest house in Caburé in 1992, the area has been rapidly transformed by changing its use from subsistence fishing to tourism.<sup>47</sup> Aware of tourism potential of the area due to its 'privileged' location between the sea and the river, many people have invested in Caburé, 'selling' the area as if it was the Park. This process has been marked by rapid structural social changes and relations in the area through the expulsion of the fishing nomads, increasing their vulnerability to access the main source of their livelihood (Redclift 1997). It has also conditioned patterns of interaction between tourists and the Park, undermining the opportunity of Atins to benefit from tourism. As observed by a woman in Atins:

'The tourists come here in the morning to see the dunes and then go back to Caburé at lunchtime... Some tourists, however, do not come here as in Barreirinhas *they* [the owners of lodging in Barreirinhas who have been investing in Caburé] say to them that Caburé is the Park. As they do not know that the dunes are here, they go to Caburé... We only observe this movement'.<sup>48</sup>

Designations of the Park and the APA have neither fulfilled their major objective of 'protecting the environment' nor brought any benefits to the resident peoples while promoting tourism as an alternative economy. Conversely, the above scenario reveals the accentuation of differences and power relations at the expense of the 'protected' nature, rather than the strengthening of sustainability of resident peoples livelihood. Besides, the government has failed to take into account socio-environmentally disruptive processes which 'coincides' with the designation and boundaries of the Park and the APA and, therefore, have contributed to the establishment of regional 'conservationist policy'. A central issue is precisely the analyses of government discourse and practice regarding this scenario.

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<sup>47</sup> Since then, its development has been extremely fast as observed by the author since her first visit to the region two years ago. During the field research, when the author asked about Caburé, many people in Barreirinhas described the rapid local change by exclaiming 'Caburé... ih! It is a city now... you will not recognise'.

<sup>48</sup> The author rented a room in a house situated in the Principal Street. The tourists have to travel along this street to go to the dunes. Every morning when they passed in front of the house, the owner said 'you see... they [the owners of guest house in Caburé] bring them in their fast small boat and then after three, four hours they come to take there back... this is the way they earn money'.



## 2.2 Government Discourse and Practice – The Role of IBAMA

While the establishment of the Park brought into regional context the presence of IBAMA, it is in the zone of influence of the APA that this environmental agency has mainly acted promoting tensions among local social actors and diverse interests. According to IBAMA staff interviewed in both São Luis and Barreirinhas, local people do not 'create problems'. Conversely, for them, resident populations' practices are not environmentally disruptive as they are related to 'their subsistence'... 'Problem is the draw fishing'. The lack of resources and equipment, which was considered due to federal government neglect, have 'limited' their practice to 'one or two operations per year'. This government 'constraint' was not only used to justify their omission regarding the draw-fishing activities, but also directed IBAMA intervention mainly around the Preguiças River in the zone of influence of the APA, where 'coincidentally' the great majority of people daily extract part of their livelihood.

The testimony of a fisherman who has lived in Atins for more than twenty years summarises the challenging position of many fishworkers regarding IBAMA discourse and practice:

'IBAMA does not come here because they do not 'earn' anything from it. They know that the powerful boats are here but they say there is no petrol to put in the car and other excuses. But, I always think that they do not want to come here and solve this problem. Imagine, if they really wanted to do something they could ask the owner of the 'Toyota' to bring them very early, work during the whole day in the area and then come back. If they had to continue the next day, they could put their hammock even here in my yard. But why should they come if they have all the comfort in Barreirinhas?'

During an interview a local woman observed that 'rather than punishing the most powerful, IBAMA is always restricting our activities as we do not have anything to give to them'. In fact, behind IBAMA discourse there are several actors and interests such as the Barreirinhas elite, who own many of these powerful boats, and many politicians. This could be illustrated by the case of a fishing engineer who had been 'temporarily retired' from IBAMA's draw-shrimp operations as he had apprehended the boat of a politician. This was commented on by some fishworkers in Atins, who argued that 'the unique person who did something in this littoral was recently retired by the 'powerful''.

IBAMA's discourse could also be challenged by its attitude in relation to a rally in the dunes of the Park, which was also promoted during the field research. According to legislation, rallies are prohibited in any National Park. This issue was raised when the author interviewed POCOF's administrator, who was dressing a T-shirt of the rally. When it was asked about the environmental legislation, he said:

'We organised a public debate in Barreirinhas with a hundred percent of agreement to hold it'. He continued, 'you know, people here do not have any entertainment... what could I do?'

Many issues arise ranging from the absolute disregard for the Park as a protected area to IBAMA's role as the environmental agency responsible for local environmental conservation and management. The 'public meeting in Barreirinhas' without involving the people living in and around the Park and informing them about the real consequences of this kind of activity in the ecosystem confirms the importance of examining the debate about *people participation*. From the beginning, many resident peoples have been kept outside the political arena as a means to reduce their opposition to the implementation of previously defined projects. By not informing the local people, this process has not enabled any participation in decision making and power sharing, which remain centralised and dominated by government and elite interests (Ghai and Vivian 1992, Nelson and Wright 1995).

The rally also shows how the national parks and 'traditional' populations have been perceived. The advertisement of the event in magazines and newspapers describe a 'pioneer adventure of conquest of a wild area... under the curiosity of peaceful local peoples, who have never seem such cars and noise... Children participated as guides, giving them an opportunity of closer participation in this successful event', which is planed to return next year 'bringing new adepts'. As it was previously presented, the Park comprises fragile ecosystems, which support unique fauna and flora. With no regional information post on the Park nor any environmental education programme with resident peoples and tourists, the organisation of this meeting well confirms IBAMA 'paradoxical' environmental policy and resource management.

It is not surprising that the environmental conservation of the Park is virtually absent in IBAMA discourse and practice. The Park is defined by IBAMA as an exotic and distant place whose ecosystem of dunes and lagoons are subjects of 'lesser degradation' than the mangrove and the ciliary vegetation near Barreirinhas. According to POCOF's administrator, the limits of the Park are 'imaginary'. As a result, 'there is no way to deal with resident peoples' as they do 'not know who is inside and outside its boundaries'. They also justify their lack of intervention as due to 'no conditions to fiscalise the whole region, which has only four people, one small boat and one 'Toyota' vehicle'. Consequently, while intervention in the Park is not a IBAMA's agenda, its restrictive legislation is implemented in the APA, where 'in theory' natural resources protection should be *conciliated* with the improvement of local populations quality of life.

This scenario has been aggravated by the centralisation of regional institutional activities in Barreirinhas. The state government has *de facto* promoted the political dependence of Atins by undermining the socio-political organisation and autonomy of the village. According to many Atins inhabitants, they were 'completely isolated and forgotten' by the São Luis and Barreirinhas authorities. The politicians go to Atins only to have their vote and 'simply disappear after the elections'. The question must, therefore, be asked as to why to vote for someone who disappears?

Because 'we do not have other alternative as there are always the same candidates'. When asked whether the village had attempt to elect a local political representative, they stated that some of them have tried but people from the village do not have 'the necessary skills' and 'resources' to be elected. A resource means a cigarette, a roll of net-line and even very small amounts of money that are given to people in exchange for their vote.<sup>49</sup>

More than being merely a local scenario, these testimonies are illustrative of the state political arena where power is centralised in the hands of the female governor and her husband, the later being 'coincidentally' the head of Planning and Economic Development Administration – GEPLAN and responsible for the proposal of regional tourism development.<sup>50</sup> IBAMA's discourse and practice as well as the relationship between Atins and Caburé represent regional tensions over control of natural resources.

### 3 FUTURE PROPOSALS FOR REGIONAL ECONOMIC DEVELOPMENT

The government's policy for regional economic development – PRODETUR II could be viewed as the consolidation of the above political-economic interests marked by the disregard for local people's livelihoods and nature conservation. It also confirms the implementation of previously debated 'politically viable rationale' in which utilitarian use of natural resources by recreational tourism development would ensure 'nature preservation' related to corporate interests (Sellars 1997). As has been shown, however, the conceptual basis of this programme has been widely challenged by the way it has been applied (Rodrigues 1999). Rather than 'guarantee the improvement of resident population quality of life' while 'promoting the preservation and maintenance of existent ecosystems', the Programme has promoted asymmetric development processes and polarised productive structures deeply associated with dominant ideology of concentration of benefits in the hands of an elite (Sachs 1999, Friedmann 1998).

It is worth observing that under the current government the Programme is influenced by neoliberal policies based on huge privatisation and reduction of social expenditure. In this perspective, PRODETUR – NE has *de facto* prioritised social investments in corporate enterprise from the beginning separating economics from environment in the name of individual interests (Opschoor 1990). Undermining resident people's control over natural resources, this 'economic

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<sup>49</sup> <sup>52</sup> An attempt to develop the village socio-political organisation was made in 1997 when the *Associação dos Moradores* was organised by the state government in order to establish a partnership with the community for the installation of electricity in Atins. But the Associação did not receive support and information greatly restricting its capacity to flourish as a local organisation. This fact was observed during the interview with its president, who asked to the author to explain the contents of an official letter. It was about the community services in the installation of electricity, which had not been accountable.

<sup>50</sup> The governor is the daughter of the former state governor and Brazilian president (1985-9) and has been in the power for a long time. The Sarney family has currently taken up a neoliberal political position. Nevertheless, she was re-elected as governor in the last elections in 1998.

development' paradigm has reinforced a historical process of impoverishment and exclusion of 'traditional' producers through the loss of the basis of their subsistence practices and consequent migration for poor peripheries of urban centres (Barkin 1997, Burgess *et al* 1997).

In spite of the government's discourse about 'improvement of local peoples life and environmental conservation', the PRODETUR II in the region of the Lençois Maranhenses has presented from the beginning a 'paradoxical' policy. In fact, there is a clear absence of adequate socio-environmental and economic evaluations on impacts that this policy may provoke on livelihood strategies of resident peoples and environmental conservation (IIED 1984). In addition, there is no attempt towards the involvement of local people in decision making nor of the strengthening of their political autonomy and the sustainability of their livelihoods.

Finally, tourism as an economic alternative for the region clearly benefits very few people, contrary to the government's 'poor people oriented discourse'. This fact was observed in Atins, where many people stated that 'tourists go to Caburé, they do not come to Atins as the owners of lodging in Barreirinhas say to them that Caburé is the Park'. This perception was observed in the village by the fact that only one or two families rent a room (belonging to someone who leaves the house) to tourists and by the presence of only one guesthouse with two rooms. The owner of which made the following statement illustrating the general feeling:

'The tourists neither disturb nor contribute to improve our lives. You have to understand that tourism is good only for who has 'what' to invest... we do not have the means even for the education of our children... why would people invest what they do not have in something uncertain?'

It is questionable why there should be investment in tourism in face of those regional potentials and needs. Indeed, rather than being an economic alternative, tourism may represent not only the supremacy of powerful actors and interests over those who have been systematically excluded from the political arena, but also the disruption of the existing 'sustainable' resource management practices. These issues may be deeper analysed with regard to the construction of the 'tourism road', the MA-402 which represents the first step towards the consolidation of the PRODETUR II. Although the new road may bring a regional alternative and even improvement of peoples access to São Luis, it is important to challenge the real political reasons for giving priority to a new road rather than improving the existing infrastructure, which could benefit the numerous settlements along it.

In addition, following the national Programme, this road will connect the region with the rest of the NE through the state of Ceará, expanding the existing axis of tourism development from the south to the north throughout the littoral. As has been indicated, however, the consequences of this policy in local sustainability have been widely criticised by many concerned academics. The

state government's position regarding this critique is not clear and even 'paradoxical'. It is worth quoting from the testimony of the manager of GETUR:

'One of the major problems in the region is the tourism from Ceará, which do not respect our nature, our littoral. The government's idea is to anticipate this process of spontaneous occupation, creating the infrastructure for tourism development'.

The issue here is precisely why to invest in an extremely expensive transport infrastructure which trajectory will even facilitate the 'spontaneous' process of the occupation of the region, as can be seen throughout the Brazilian coast where the Programme have already been implemented. Despite the above government statement, this context illustrates the consolidation of a historical incorporation of 'isolated' regions into development schemes by investing in large-scale infrastructure (supported by governmental and international development agencies) and followed by the privatisation of adjacent valuable lands and elite control over natural resources.

Besides, the construction of the road does not have a consensus among resident peoples. On the one hand, many have argued that the region and Barreirinhas are not 'prepared to receive mass tourism'. A common argument was that 'we do not have the infrastructure even for us... you cannot imagine during holidays when the city is crowded with tourists... the quantity of waste in the streets triple... can you imagine when this road arrives here?' On the other hand, many realise that the new road will shorten by almost a hundred kilometres the distance between Barreirinhas and São Luis, increasing the proximity and comfort and bringing new economic opportunities.

However, it was noted that there was no discussion about the PRODETUR II *per se* nor the possibility of paving the last half of the existing roads. These issues were in a certain way avoided by the responsible authorities and excluded from local debate, as resident peoples do not have any profound ideas about the programme and its consequences in other regions. The only authority that from the beginning adopted a contrary position to the new road was the 'temporarily retired' IBAMA fishing engineer. He argued that the first environmental impact of the road could be observed in the region of Munin near São Luis:

'Since the construction of the road an average of thirty and forty buses per weekend has accessed its affluence rivers... the problem is that there is no infrastructure to receive these people, resulting in the rapid pollution of this ecosystem... As part of IBAMA staff, I know that the same process will happen in the region of the Park... maybe even worst as Barreirinhas is the seat of the region and there are many influent people 'interested' in the profitability that this road may bring to them. The regional environmental consequences will be unprecedented'.

Indeed, the MA – 402 will connect São Luis directly to Barreirinhas, crossing many fragile ecosystems such as *cerrado*, *restingas* and affluence rivers, and near the zone of influence of the Park, representing the first step towards an unseen regional environmental disruption (UEMA 1999). Although the trajectory of the road has been slightly modified by an Environmental Impact Assessment – EIA, this study only refers to physical issues, neglecting wider predictability of

future socio-environmental implications. An attempt in this direction has been made through an 'ecological-economic assessment' but the construction of the road has already started, bringing about not only environmental disruption, but also a political process of land speculation mainly around Barreirinhas and the Park lands, as in the case of Caburé. Finally, it is worth stressing that the authorities of the Environmental Agency in São Luis, responsible for the approval of the road, have unofficially stated that the road is *de facto* an environmentally 'predator' instrument and that they are totally aware that 'these people' will be, as part of the government development process, expelled.



## CONCLUSIONS

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More than being just a governmental strategy for environmental conservation, protected area paradigm has represented a specific conception of nature–society relationship. Originated in a context of capitalist consolidation, rapid urbanisation and frontier development in the United States, this paradigm influenced early preservationist ideology of ‘wilderness’ in which natural environment and the human world were viewed as enemies. Protected area paradigm also gave rise to a ‘politically viable rationale’ for environmental movement in which utilitarian use of natural resources by recreational tourism development would ensure nature preservation, representing a polarisation in values within environmental protectionism. This development conservation *rationality* has deeply influenced environmental policies by means of protected area designation in developing countries, fostering a paradoxical model in the history of nature preservation.

Nature was viewed as non-scarce, offering an inexhaustibly supply of resources for economic development. Configuring essentially a *reactive* policy against exploitative approaches to resource use and social trends of privatisation, vast majestic scenery areas have been ‘preserved’ for the admiration of urban populations. Established in fragile ecosystems of ‘isolated’ regions, however, protected areas have been implemented often by top-down approach and with no major concern to existent social codes, economic–environmental dynamics and resident population’s participation in decision making. Bringing into the scenario diverse interests, this paradigm has shifted patterns of nature–society interaction, configuring a complex politicised environment through the creation of tensions between resident people’s livelihoods and protected area paradigm.

The Lençois Maranhenses National Park in Brazil well illustrates the imposition of the above *rationality* upon ‘traditionally’ occupied environmentally sensitive regions in developing countries marked by the absence of wider ecological criteria informing nature protection in consonance with economic development interests of an elite. Perceived as obstacles to government development and conservation strategies, resident peoples and their ‘traditional’ resource management practices have been deeply disregarded by a conservative vision regarding regional environmental sustainability. Combined with the incorporation of modern resource management practices, political-economic interests in natural resources, conservationist rhetoric and lack of local political autonomy, the basis of resident peoples economy of subsistence have been systematically disrupted through conflicts over the control of natural resources.

The consolidation of a process of socio-environmental disruption can be observed in government proposals for regional economic development, which has clearly reproduced neoliberal paradigm centralised in corporate hegemonic capitalism, neglecting structural social demands and excluding local populations from the political arena. Illustrated by local testimonies

and the absence of debate about the implications of the construction of the road MA – 402 and the PRODETUR II, government priority on tourism for regional economic development has represented the supremacy of powerful actors over those systematically excluded from the decision making process. The absence of political-economic incentives for the improvement of the potential dimension of the existing socio-economic dynamics and peoples capacity of maintaining their means of livelihood while not undermining resources base as well as the results of PRODETUR – NE may challenge government discourse on regional social improvement and environmental conservation. In this perspective, the context facing the Lençois Maranhenses represents the continuity of a process of social exclusion and environmental disruption under political rhetoric of economic development as a tool for improvement of poor peoples lives as well as protected area designation as a strategy for nature conservation.

Finally, this analysis brought into scenario a hierarchy of values in which few ‘islands’ are preserved much more as a *reactive* answer to ‘unsustainable’ development approaches and living standards of urban society than for the unity of nature for its own sake, and far from the benefit of resident peoples. Analysing the impacts of development and conservation policies on resident peoples’ livelihoods and environmental conservation of environmentally sensitive regions, this study tried to contribute to a deeper understanding of the complex root causes of social exclusion and environmental degradation in developing countries.

The fact that this process has just started in the Lençois Maranhenses may represent a major challenge to environmental development policy in reflecting and crossing the boundaries of economic development and environmental conservation towards the integration of resident people’s livelihood strategies into the development of environmentally sensitive regions. After a century of history and experience in conservation of ‘traditionally’ occupied environmentally sensitive regions, it is high time to ponder on the ethic and power relations behind human practices and understanding of the values of natural and cultural diversity.



## APPENDIX 1

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### FIELD RESEARCH – Trajectories

In 1997, the trajectory proceed west from the Delta do Parnaíba (east), beginning with a long journey throughout many rivers and small fishing villages within a typical boat daily used by the local populations – *Linha* until Tutóia, the most important and prosperous harbour of the region in the past. The voyage continued along a sandy road in a four-wheel Toyota vehicle towards Barreirinhas, passing through many small villages and even isolated families localised along the way. From there, to arrive at Lençóis Maranhenses National Park and its fishing villages of Mandacaru and Atins, a four hours journey was undertaken by another *Linha* on the Preguiças River.

The late trajectory in July 1999 started in the capital city of the state São Luís (west), where some interviews were carried out, flying in a small local plane towards Barreirinhas (east). The field research followed directly to Atins by crossing along the Preguiças River. After conducting local research in Atins and Barreirinhas, a four-wheel Toyota vehicle was used travelling along the existing road for eight hours to reach São Luis.

The author translated all testimonies and took the presented pictures during the late field research.

**APPENDIX 2**

**Table 1 – Protected Areas Categories and Management Objectives**

CATEGORY	TYPE	OBJECTIVES
I	<b>Scientific Research</b>	Protect nature and maintain natural processes in an undisturbed state. Emphasise scientific study, environmental monitoring and education, and maintenance of genetic resources in a dynamic and evolutionary state.
II	<b>National Park</b>	Protect relatively large natural and scenic areas of national or international significance for scientific, educational and recreational use in the absence of human existence.
III	<b>Natural Monument</b>	Preserve nationally significant natural features and maintain their unique characteristics.
IV	<b>Nature Conservation Reserve Wildlife Sanctuary</b>	Protect nationally significant species, biotic communities, or physical features of the environment when these require specific human manipulation for their perpetuation.
V	<b>Protected Landscape</b>	Protect nationally significant natural landscapes characteristic of harmonious interaction of people and land while provide opportunities for public recreation and tourism within peoples normal life and economic activities.
VI	<b>Resource Reserve</b>	Protect natural resources for future use and prevent or contain development that could affect resources pending the establishment of management objectives based on appropriate knowledge and planning.
VII	<b>Anthropological Reserve</b>	Protect significant cultural, historic and archaeological site. Allow societies to live in harmony with the environment, undisturbed by modern technology.
VIII	<b>Multiple-use Management Area</b>	Sustain production of water, timber, wildlife, pasture, and outdoor recreation. Conservation of nature oriented to supporting economic activities (although specific zones can also be designed within these areas to achieve specific conservation objectives).
IX	<b>Protected Area for Local Use</b>	Support rural development through rational use of marginal lands and provide stable employment opportunities. Multipurpose management and provide for recreation, tourism, hunting, fishing. Produce timber and forage on sustained yield basis.
X	<b>Biosphere Reserve</b>	Maintain sample ecosystems in natural state, ecological diversity and environmental regulation. Conserve genetic resources and provide for education, research and environmental monitoring.
XI	<b>World Heritage Site</b>	Protect significant cultural, historic, archaeological sites, scenic resources and green areas. Conserve genetic resources and provide for education, research, recreation and tourism.

Source: Adapted from IUCN 1990:59, Wells and Brandon 1995:2, West and Brechin 1991:7-9, McNeely et al 1990:59

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