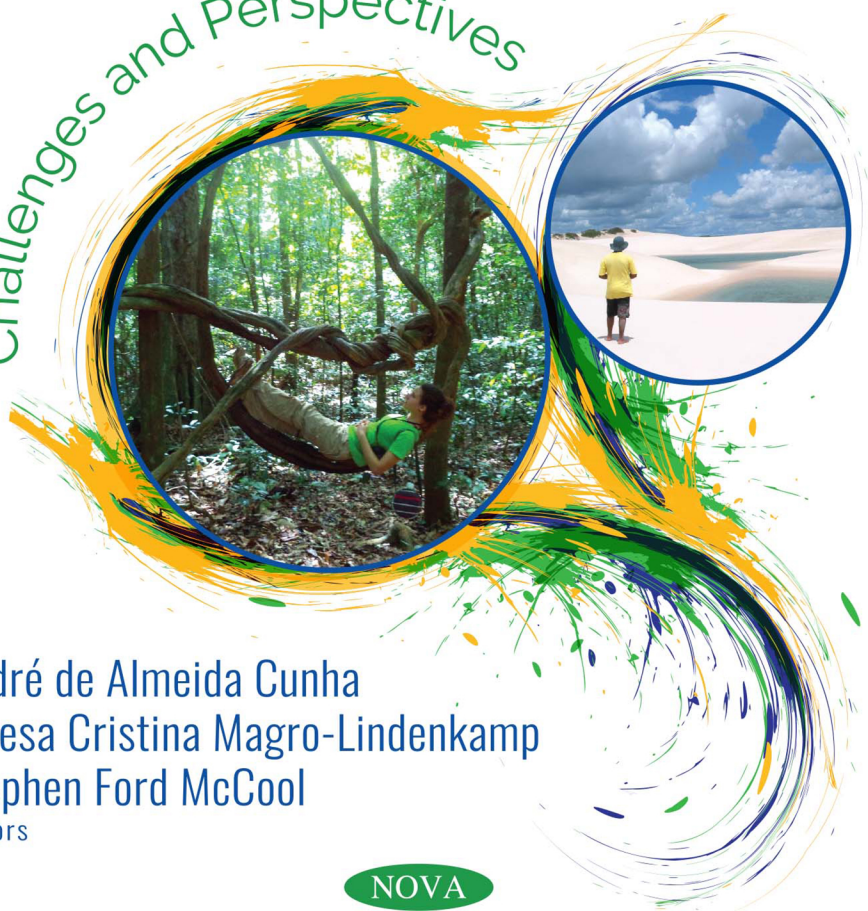


Tourism and Hospitality Development and Management

Tourism and Protected Areas in Brazil

Challenges and Perspectives



André de Almeida Cunha
Teresa Cristina Magro-Lindenkamp
Stephen Ford McCool
Editors

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TOURISM AND HOSPITALITY DEVELOPMENT AND MANAGEMENT

**TOURISM AND PROTECTED
AREAS IN BRAZIL
CHALLENGES AND PERSPECTIVES**

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CHALLENGES AND PERSPECTIVES

**ANDRÉ DE ALMEIDA CUNHA
TERESA CRISTINA MAGRO-LINDENKAMP
AND
STEPHEN FORD MCCOOL
EDITORS**



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CONTENTS

Preface	ix
Acknowledgments	xv
Chapter 1	
Coping with the Effects of Tourism in Natural Areas	1
<i>Teresa Cristina Magro-Lindenkamp and Anna Julia Passold</i>	
Chapter 2	
Nature Tourism Research in Brazil: A Preliminary Scientometric Approach of the Last 20 Years	25
<i>André A. Cunha and Cassio M. M. Costa</i>	
Chapter 3	
Partnerships for Developing Tourism in National Parks	47
<i>Camila Gonçalves de Oliveira Rodrigues and Jorge Madeira Nogueira Junior</i>	
Chapter 4	
Tourism Attractiveness Index of Protected Areas of Brazil	67
<i>Thiago do Val Simardi Beraldo Souza, Brijesh Thapa and Ernesto Viveiros de Castro</i>	

Chapter 5	Building Capacity for Protected Area Public Use Management and Planning through a Multi-Threaded Partnership <i>Stephen Ford McCool, Michelle Zweede and Suelene Couto</i>	99
Chapter 6	Public Use, Biodiversity, and National Park Management in Brazil and the United States <i>Leandro M. Fontoura and Lowell W. Adams</i>	117
Chapter 7	Modeling Viewshed in Natural Areas: Tourism Planning and Implementation Using GIS <i>Romero Gomes Pereira da Silva, Carlos Henke-Oliveira, Everaldo Skalinski Ferreira, Raquel Fetter, Ronaldo Gomes Barbosa and Carlos Hiroo Saito</i>	139
Chapter 8	Visitor Use Planning at Mariquinha Waterfall, Campos Gerais National Park, Brazil <i>Lilian Vieira Miranda Garcia, Jasmine Cardozo Moreira and Robert Clyde Burns</i>	157
Chapter 9	Demonstration Sites: A Practical and Powerful Tool for Evaluating Options, Developing Best Practices, and Building Capacity in Protected Areas <i>Bonnie Lippitt and Ryan Finchum</i>	179
Chapter 10	Freedom, Sustainability and the Competing Discourses of Tourism and Mining in the Espinhaço Range Biosphere Reserve, Brazil <i>Mozart Fazito and Luiz Carlos Spiller Pena</i>	211
Chapter 11	Tourism in the Surroundings of Protected Areas: The Obstacles to Social-Productive Inclusion <i>João Paulo Faria Tasso and Elimar Pinheiro do Nascimento</i>	233

Chapter 12	Common Sense in Tourism among Rio Negro Sustainable Development Reserve Residents <i>Susy Rodrigues Simonetti, Elimar Pinheiro do Nascimento and Maria do P. Socorro R. Chaves</i>	255
Chapter 13	Participatory Planning in Tourist Activities with Botos at Anavilhanas National Park, Amazonas, Brazil <i>Marcelo D. Vidal, Priscila M. C. Santos, Josângela S. Jesus, Luiz C. P. S. Alves and Maria P. S. Rodrigues Chaves</i>	275
Chapter 14	Community-Based Tourism in Protected Areas: A Move Beyond “Paper Parks” <i>Nelissa Peralta, Rodrigo Ozorio, Pedro Nassar and Gustavo Pinto</i>	297
About the Editors		319
Index		321

PREFACE

This book explores the relationships between tourism and protected areas in Brazil, and was designed to support research and management practices in the real world and generally build capacity to strengthen connections between Brazilian society and its natural heritage. The chapters highlight public policy, planning and management issues to link theory to practical application in thinking and implementing tourism in protected areas. The book focuses on social, environmental and managerial aspects. It also includes methodological issues and analysis, including new approaches to tourism planning in protected areas. Upcoming challenges, such as public-private partnerships for tourism development, fewer resources from governments, and increasing visitor numbers are key topics in dealing with market demand to guarantee principles of sustainable tourism in Brazilian protected areas.

Considerations of community views and the obstacles to social inclusion in tourism development in and around protected areas, and the conflicts with other economic alternatives, such as mining, are also discussed. A fundamental aim is to contribute to the improvement and implementation of applied science for the practice of sustainable tourism in the Brazilian

protected areas, and to archive the Brazilian experience so others abroad may learn.

Nature tourism is a still new area of knowledge in Brazil, and most papers have been published in regional and national journals. On the other hand, there is an increasing flux of tourists and a high demand to improve visitation on these protected areas. A myriad of types of nature tourism, local people, protected areas, cultures and biodiversity can be found in Brazilian landscapes. All of them need study and better support. Thus, this book is just a piece of contribution to the development of nature tourism science in Brazil, the management of tourism in Brazilian protected areas, and could be a useful reference for researchers around the world to have a glimpse of what has been developed in these themes in Brazil

The development and management of tourism in protected areas is a complex and challenging task, particularly in developing and mega-diverse countries, such as Brazil, where demands and expectations of protected areas are not only growing but diversifying as well. We believe that recreation and tourism not only provides a fundamental basis for connecting people with their natural heritage, but also represents a range of sustainable business opportunities, enhances community resilience and provides the setting for improving quality of life in small rural communities dependent on natural resources and vulnerable to globalized forces and trends.

In addition to business, the sustainable development of tourism in protected areas brings unique opportunities for sensitizing and changing people's behavior towards nature, to promote the protection and restoration of species and ecosystems, and to benefit local populations. However, achieving these goals requires hard work and partnership between research and management. And so far, it seems the road to appropriate knowledge, as quantum mathematician David Deutsch argues in his provocative book, *The Beginning of Infinity*, is just at its start.

These opportunities and challenges convinced the editors of this volume, Andre de Almeida Cunha, professor of Ecology and Tourism at the University of Brasilia, Teresa Cristina Magro-Lindenkamp, professor of

Protected Areas Management at the University of São Paulo, and Professor Emeritus Steve Ford McCool from the University of Montana, to synergistically collaborate in responding to these needs

In producing this book, we were motivated by not only a common passion for our natural heritage, but also in a belief that it is possible to integrate responsible tourism and visitation with conservation of that heritage while also contributing to the well-being of those impacted. Research plays an invaluable role in providing knowledge and wisdom about these goals and how various actors may contribute to their realization. Tourism development and management of heritage are inevitably linked in many different ways at different scales. Research provides the information needed to understand how these linkages function and how management may better manage them.

Second, if we have learned one thing about the 21st century, it is that the world is complex, ever-changing, and uncertain. And yet, Brazilian protected areas represent a great opportunity to promote sustainable development through nature based tourism, particularly in places where people are directly dependent on access to natural resources, vulnerable to larger scale, and even global level forces and decisions, and where incomes are low. This potential in many parts of Brazil has not been efficiently developed and is poorly understood.

The three of us had reflected in several discussions that although there is a lot of research being done in Brazil about public use and tourism in protected areas, Brazilian authors are rarely mentioned by peers who work with the same theme in other countries. We believe that we have many common challenges and much to exchange and learn from researchers and managers from other countries. And we concluded that publishing this work in English rather than Brazil's native language of Portuguese would be a good method to communicate to foreign researchers working in related areas and who would like to obtain updated information about the possible gaps that still need to be worked and deepened in Brazil. We want this compilation to be useful in possible collaborative projects between Brazilian

and foreign universities, as well as for the exchange and application of knowledge to managers of protected areas and nature tourism, in Brazil and in other countries.

We also intended to bring a view from the southern hemisphere, from the reality of a country with a diverse and yet threatened nature, with a context of exclusion from decisions impacting them, with great influences of powerful interests of global and national players for commodities such as iron, soy bean, corn, beef, coffee and orange juice. In the long run, we believe that the economical, social, cultural and ecological importance of nature tourism in Brazil will be recognized and efforts in research, teaching, management, and tourism business will lead to a more sustainable tourism, both in and adjacent to protected areas..

The content and language of this book are directed to undergraduate and graduate students, and also for protected areas and tourism managers. Given the scarcity of studies on nature tourism in Brazil published in English, this is also a welcome reference for researchers worldwide. The main audience for this publication are students from tourism, environmental sciences, ecology, biology, sociology, economics, and interdisciplinary areas related to recreation and tourism in protected areas and researchers in these areas. It brings a diverse overview on the problems and potential solutions for the management of tourism in protected areas in a developing country, being particularly useful for protected area managers and staff, and also for NGOs and entrepreneurs interested in how to pursuit the sustainable tourism in protected areas in similar conditions.

A number of new undergraduate, graduate and specialization courses focusing on nature tourism, ecotourism, sustainable development, and protected-area management have been created in the last decade in Brazil. Also, international courses in developed countries were designed aiming to contribute to sustainable tourism and research in protected areas located in developing countries. However, most books available in the international literature today focus mostly on the reality of developed countries, with few examples from the aspects of the nature tourism in countries with a distinct economical phase. This book fills part of this gap, being a reference treating

with theoretical and practical issues on how to understand, to deal and improve the benefits from tourism in protected areas, based on the point of view from Brazilian researchers. This is also a source of information for protected area managers and private entrepreneurs aiming to minimize the negative and improve their positive impacts on environmental and social aspects.

We recognize that the chapters gathered here are only a small sample of the research done in Brazil on tourism and protected areas. More than a representative sample, or the result of an exhaustive collection effort, this book is designed to illustrate the diversity of work on tourism and protected areas being conducted in Brazil. Therefore, it should be seen as a brief introduction about the research and realities of tourism management in Brazilian protected areas. There are several researchers from different areas of knowledge and managers in different realities, with very important and complementary visions and contributions for the research and management of tourism in the Brazilian PAs, which are not necessarily reflected in this book.

The number of publications in Portuguese on nature tourism, ecotourism and tourism in protected areas is growing in Brazil, but the exchange with other countries is limited although many scientists in the world are interested in Brazil and its protected areas, which constitute about 10% of all the terrestrial area protected in the world, as listed in the UN Database on Protected Areas. As well, the recognition and strengthening of a national scientific community studying these topics is still incipient. We hope that this book will be another incentive to increase the exchange of knowledge, contribute to the expansion and consolidation of this area of knowledge in Brazil, and stimulate all types of partnerships. Above all we wish to leverage the development of applied, transdisciplinary research aimed at supporting the effective management of tourism with a view to sustainability, together with the objectives of protected areas.

Despite the instability in today's world, protected areas will be increasingly important as a refuge for biodiversity as well as for humans. With luck, we will see the day when these areas will be valued and preserved

and viewed as essential to human life. And so. we continue to maintain the ideal of producing knowledge for sustainable development through nature tourism, maintaining and enhancing the integrity of its biodiversity, preserving natural beauty and bringing benefits to visitors and local populations of the most beautiful and exuberant regions of the planet.

Enjoy your Reading!

Boa leitura!

André de Almeida Cunha

Teresa Cristina Magro-Lindenkamp

Stephen Ford McCool

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Chapter 1

COPING WITH THE EFFECTS OF TOURISM IN NATURAL AREAS

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ABSTRACT

It can be stated that tourism in natural areas is a successful business model in many Brazilian regions. A great part of this tourism flow takes place in public protected areas, especially in national parks, but also in the private ones, such as Reservas Particulares do Patrimônio Natural – RPPN (Natural Heritage Private Reserves). In relation to Brazilian federal areas, few are the national parks with an extensive public use history, such as the Iguaçu, Tijuca, Itatiaia, Serra dos Órgãos and most recently Fernando de Noronha, Lençóis Maranhenses, Chapada Diamantina, Chapada dos

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Veadeiros, Jericoacoara etc. Most parks where recreational use has increased still have to deal with the dilemma of expanding recreational areas when the effects of certain types of activities on the natural environment are unknown. This impasse can be sorted out by considering work-related experiences in similar places and by implementing recreational impact monitoring plans. However, it is important for managers to distinguish tourism planned from activities not planned in public use zones in the context of a management plan. A main issue faced by the areas that have not gone through a management planning process is the high spontaneous demand for tourism activities with which they have to deal. Prohibiting use in this situation may not be an effective strategy if considering the possible insufficient enforcement, and probably a negative influence in people's opinion about the management institution. Indicators that assess the effects of recreational use on natural resources measure the effectiveness of tourism impact management programs on high conservation-value areas and which has been set for public visitation. This chapter provides an overview on recreational impacts and suggests the use of indicators resulting from experimental research in Brazilian natural protected areas.

Keywords: public use, tourism, protected areas, impact, visitation, monitoring, indicators

INTRODUCTION

Growing Concern about Tourism and Recreational Impacts in Brazilian Natural Areas

It is challenging to introduce facts concerning the negative impacts of tourism in Brazilian protected areas due the lack of related publications in the country. Researchers and experts try to understand how and when the subject is no longer seen as a concept but as results and conclusions from experimental research.

Considering the available publications as a basis, there was no mention of this concern until the end of the 1980's. The approach given by tourism experts used to be based on the notion of carrying capacity. In the same period, management plans for Brazilian national parks used to bring, in the

content of management and development, the item Determination of the Carrying Capacity only as a concept (Brasil 1981a, Brasil 1981b, Brasil 1981c), mentioning mostly Wagar (1964) in his classic monograph “The carrying capacity of wildlands for recreation”.

For the first time, the Management Plan of Emas National Park (Brasil, 1981e) concluded however that no methodology at the time could objectively determine carrying capacity. However, a closer reading in the same document reveals that the term “carrying capacity” was, in fact, related to animal ecology in the context of fauna resources management and not to human carrying capacity associated to recreational use. On the other hand, the Management Plan of Abrolhos National Marine Park (IBAMA 1991) recommended a maximum number of visitors and boats for different zones in the park, but did not indicate the methodology used for reaching those numbers.

In time, tourism expertise has helped expand the knowledge of recreational impacts on protected areas. Papers reporting experimental research related to visitor impact monitoring and management in Brazilian protected areas started toward the end of the 1990’s (Takahashi 1998; Magro 1999).

From the outcomes of research and technical/scientific meetings, most recent frameworks brought less empirical results by using tools such as the recreational carrying capacity (Cifuentes 1992), Limits of Acceptable Change – LAC (Stankey et al. 1985) and Visitor Impact Management – VIM (Graefe, et al. 1990). Although other frameworks are mentioned in this chapter, for McCool and Cole (1997) the processes are conceptually similar, and have been developed specifically to deal with the issue of carrying capacity in wildlands and national parks. The main emphasis in these methods is the understanding that management decisions are based on goals established for natural heritage and visitor experiences rather than on current visitation levels and presence of infrastructure. With the increase of nature tourism and significant regional economic development, part of the national goals for nature conservation is reached through tourism activities in natural areas. Kinker (2001) pointed out recreational use as an opportunity to increase financial resources in protected areas and its surroundings. And so,

if tourism in protected areas was understood as a great opportunity, when was it first viewed as a management problem? The answer is that Brazilian business nature-based tourism only started to expand in an intensive way at the end of the 20th century, advancing more in pristine private lands, but also in public areas. At this point, federal managers started to demand more detailed management plans, including specifications for allowable recreational activities in protected areas, in line with national conservation goals. The carrying capacity framework was then used to plan recreational activities. In the 1990s, the first papers in Brazil pointed to the fact that more important than controlling the number of visitors was to determine future desired conditions, and from there determine the most effective management actions. Another important understanding was that negative impacts were not always directly related visitor use levels.

From that moment on, a few papers were published regarding the monitoring of recreation use impacts using frameworks such as Limits of Acceptable Change – LAC -- and Visitor Impact Management – VIM -- which were tested in Brazilian protected areas. As a result, natural and cultural conditions are known, indicators are chosen for predicting undesirable changes and a periodic monitoring system. One of the attributes of these frameworks is the previous knowledge of the natural resources in the area in order to understand the relationships between recreational use and the response of vegetation, fauna and soil as examples after use.

However, in Brazil many projects and documents chose recreational carrying capacity for many reasons. First, there are few places with a reasonable understanding of ecosystem components and the cultural and social factors that may be related to tourism impacts. Second, applying numerical value-based management turns out to be the fastest and most easily implemented solution for controlling visitation. Unfortunately, most researchers and some managers agree that from the viewpoint of ecosystem conservation this option does not offer the best answer in terms of providing a recreational experience with quality. Finally, many have concluded that empirical knowledge based on the practical experience and scientific research in Brazil leads to a combination between recreational carrying

capacity and visitor impacts monitoring frameworks. This chapter summarizes the trend in managing tourism impact in Brazilian natural areas.

Management and Zoning as Instruments of Tourism Promotion

The National System of Protected Areas – SNUC -- defines two protected area groups: Strictly Protection Areas and Sustainable Use Areas (MMA 2003). In Strictly Protection Areas the goal is to preserve nature permitting only indirect use of natural resources, whereas the Sustainable Use Areas integrates nature conservation and the sustainable use of natural resources.

In this chapter, *public use* shall mean the recreational activities for education, recreation, sports, contemplation and culture, which is also a term adopted internationally by recreational use experts. In this chapter the activities related to religious practices are considered a form of public use, but non-recreational. Aside from the term public use, Passold and Kinker (2009) have noticed in the general literature and in legal instruments – federal, state and municipal – the use of related terms such as visitation, ecotourism, ecotouristic activities, sustainable tourism, tourism in natural areas, ecological tourism and adventure tourism.

Public visitation will always be subject to restrictions established in management plan or in specific regulations, no matter if the goals are touristic, recreational or educational. For national parks, recreational use is allowed and always strongly recommended. In all other use categories, recreational use is allowed, except for Ecological Stations and Biological Reserves, where only for educational purposes is public use allowed. In Environmental Protection Areas, the criteria for public visitation are defined by the landowner and by the managing agency when on public lands. In private areas, it is up for the landowner to set the conditions for visitation, always abiding by legal requirements and restrictions.

Table 1 presents the allowed uses in the SNUC Act, for full protection and sustainable use protected areas, in which scientific activity is considered as a type of use.

Table 1. Public Use in the SNUC Act for full protection and sustainable use protected areas

Group	Category	Public use
Strictly protection Indirect use of natural resources	National Park Natural Monument Wildlife Refuge	Recreational*, Educational, Scientific
	Ecological Station Biological Reserve	Educational, Scientific
Sustainable use Integrate nature conservation with sustainable use of natural resources	APA - Environmental Protection Area ARIE - Relevant Ecological Interest Area FLONA - National Forest RESEX - Extractive Reserve RDS - Sustainable Development Reserve Wildlife Reserve	Recreational, Educational, Scientific
	RPPN - Natural Heritage Private Reserve	

* encouraged.

One of the most important factors in the practical context of visitor management is the zoning process. The framework used for protected areas planning in Brazil (IBAMA 2002), mentions the following zones where some sort of public use is allowed: primitive use, extensive use, historical-cultural, intensive use and restoration. Table 2 presents the uses for each zone and the intervention level in natural environment.

The suitability of using distinct areas within the protected area for public use are identified through measurable physical criteria. The prevailing use classification in Brazil predicts the degree of intervention that an area may have (low, medium or high). And it is precisely in understanding this condition that many mistakes can be avoided in both planning and in managing the impacts of visitation.

The primary basis for making decisions about tourism in protected areas are a set of questions. One of them is to fix priority on assessing recreational use impacts. If one area was classified as an intensive use zone, which implies high intervention level, it will permit a variety of structures such as

visitor centers, restaurants, parking areas, campsites, and picnic and swimming areas.

In intensive use zones, a high number of visitors is expected and concentrated use is a management choice. Based on architectural planning, it may not be necessary to limit visitation at these sites. Visitor monitoring should consider more the social than the environmental indicators of quality. However, where recreational use impacts are verified, management solutions may consider the controlling or limiting use.

Table 2. Allowed uses in zones and intervention levels for national parks

Zone	Intervention level
Primitive use Low impact Recreational, Educational, Scientific	None or low intervention zone Infrastructure not allowed
Extensive use Recreational, Educational, Scientific	Medium intervention zone Campsites and viewpoints with simple infrastructure, trails, signs, rest areas, swimming areas. No food sales or other items
Historical-cultural Educational, Scientific	
Intensive Use Recreational*, Educational, Scientific	High intervention zone Visitor center, restaurant, camping with full infrastructure, parking area, visitor support area such as viewpoints, swimming areas, picnic area and other
Restoration	

* encouraged.

MANAGING THE IMPACTS OF TOURISM

Frameworks for Tourism Impacts Management

Brazilian researchers are aware of the existing planning concepts and frameworks, such as the Recreation Opportunity Spectrum – ROS (Clark and Stankey 1979); Limits of Acceptable Change – LAC (Stankey et al.

1985); Visitor Activity Management Process – VAMP, (Graham et al. 1988); Visitor Impact Management – VIM (Graefe et al. 1990); Visitor Experience and Resource Protection – VERP (US Department of the Interior 1993), and the Protected Area Visitor Impact Management – PAVIM (Farrel and Marion 2002).

The purpose of this chapter is not to suggest the best framework for Brazilian conditions. Each has specific elements, and the choice depends on the quality and quantity of available environmental and social information and the desired conditions for the future, determined by the management goals for that area.

Three documents can provide a more detailed reading on the subject. The first one is Nilsen and Tayler (1997), who provide a comparative analysis among these frameworks thus indicating their historical evolution. They present a summarized table including the steps of the process, indicators and standards, best application of the method and strengths and weaknesses.

The second publication that brings a great contribution was presented by Eagles, McCool and Haynes (2002), in which they provide a comparison among five visitor management frameworks (LAC, VIM, VERP, VAMP, ROS). ROS can be understood more like a zoning and space use classification system than as a planning framework. In the present volume, Souza, Castro and Thapa (this volume) have contributed with a chapter using the ROS as a basis to develop a classification system for recreational areas.

Also McCool et al. (2007) provide the most comprehensive summary of U.S. planning frameworks (ROS, LAC, VERP and VIM) adding the Benefits-Based Management (BBM) not well known or mentioned in Brazilian literature. The difference in this publication is the style of presenting the frameworks, indicating in which situations the use of them is more or less appropriate. Authors use their extensive research experience to provide comments and reflections to help managers make better decisions when facing issues of public land recreation planning.

ICMBio and other state public institutions have a zoning system defined in the Methodological Planning Guide (IBAMA 2002), which must be used in all federal public use planning processes in Brazil. By using visitor

management frameworks, decisions could be based on systematic data collected through monitoring systems as suggested by Garcia and others (this volume).

For Barros and Dines (2000), each of these methods emphasizes the desired conditions for natural areas rather than the amount of use these areas can tolerate. That means an advance when comparing to recreational carrying capacity, showing that numeric solutions are not enough to meet natural area management needs.

It is important to mention studies performed in Brazilian areas with the intent to test and adapt LAC and VIM frameworks (Takahashi 1998; Freixêdas-Vieira et al. 2000; Carvalho et al. 2000; Raimundo and Vilani, 2000; Passold 2002; Robim et al. 2011). According to Barros (2003), results from Brazilian experiences show that these planning frameworks, using indicators and standards for desired conditions, suits the natural protected areas reality. As well, their results helped in visitation program development, contributing to reach protected area management objectives.

Although international advances obtained in recreation ecology studies have demonstrated the usefulness of these planning frameworks, the recreational carrying capacity (Cifuentes 1992) is still used in Brazil. One of the reasons is the fact that it leads to numeric results for controlling visitors flow. For Lindberg, McCool and Stankey (1997) recreational carrying capacity is not appropriate for managing tourism, even if it appears attractive, given the complexity found in the natural environment.

For a long time, the criticisms expressed against the notion of carrying capacity mentioned by several writers (e.g., Manning 1986; Lindberg, McCool and Stankey 1997; Magro 1999; McCool and Lime 2001) didn't encourage Brazilian institutions to adopt a more refined framework to monitor public use impacts in pristine areas. Recently, there have been investments in federal and state levels, both for guidebook development that considers the most important aspects of the existing frameworks, and for their staff training on a way to consolidate recreational impact monitoring in daily routines with resorting to a carrying capacity paradigm. In 2010, the Environment Department of São Paulo State supported by the World Wildlife Foundation – WWF and the Inter-American Development Bank –

IDB developed the “Protected Area Visitation Impact Monitoring and Management Manual” (São Paulo 2010). The manual recommended a participatory process between experts and institutional staff that implements monitoring systems in a more effective way. Potential indicators of recreational impact were tested in three state parks trails, resulting in a minimum list that considers technical and managing staff aspects for implementing and maintaining a monitoring system. As a result, it suggests the following indicators would be useful: trail width, damage to structures, change in animal behavior, visitor experience; and indicators assessed through census: number of non-official trails, drainage problems and litter. Passold, Magro and Couto (2004) have also warned about the barriers to implementation of visitation monitoring programs in Brazilian protected areas, facing the lack of continuity in data collection and the lack of institutional commitment.

Finally, in 2011, ICMBio launched a Methodological Guide (ICMBio 2011) to establish a common reference and guiding principles for improving visitors’ experience and natural and cultural resources protection in all federal Brazilian protected areas. This Guide presents a list of 25 indicators applicable for visitors’ experience and 23 related to environmental factors.

Research Outcomes in Brazil

The public use impacts issue has been intensively studied and discussed in the United States of America, Australia and some countries in Europe. Marion et al. (2016) have made a systematic assessment of studies related to recreation ecology during a period of 80 years and listed over 1,200 citations. In South America, there are few publications regarding recreational use in primitive areas. In a review paper, Barros, Monz and Pickering (2015) found 47 publications classified as recreation ecology studies, mostly developed in Argentina and Chile, but did not cite any paper in Brazil, since the focus of their review was the Andean region.

The academic world agrees that applied research provides scientific answers for solving problems. Therefore, should the public visitation issue

not be seen as a major problem in the case of Brazilian protected areas? In Barros (2003), the staff in charge of protected areas for years faced visitation impacts have sought alternatives to better solve them, but little has been done about it. In a few cases, recreational use was even prohibited, because managing it would imply financial expenses and human resources that are unavailable.

When use levels in natural areas were low, the way of coping with recreational management was different (Magro 2003). Closing trails, campsites and prohibitions on access in some national parks did not lead to public outcry. However, in the last 20 years, significant growth in public use has led to pressure for reestablished access in these areas, causing administrative problems. Demands for access, mostly for adventure sports, have increased. The perspective changed from a public condition that seemed to be unchanging to a participatory position. The prevailing scenario demonstrates public dissatisfaction regarding the implementation of mitigating measures that have become permanent management actions.

One of the first Brazilian authors to deal with this issue in a more detailed way was Takahashi (1998). The main goal of that study was to assess public visitation impacts, focused on visitors, their preferences and perceptions in two areas in southern Brazil: Pico do Marumbi State Park (a public area) and Salto Morato Natural Reserve (a private reserve). As a result, indicators that best assessed the effects of recreational use were tested and classified as ecological and recreational. For Marumbi State Park, the analysis showed that the best indicators using simple equipment and inexperienced people were: aeration porosity, microporosity, soil resistance to penetration in both depths and soil density. For Salto Morato Reserve, the best indicators were: soil resistance to penetration between 5–10 cm, microporosity, aeration porosity and carbon content. Magro (1998) studied the physical parameters that most influenced public use in a long-range trail at Itatiaia National Park using the described methodology in Bayfield and Barrow (1983). Data series over two different times were collected and compared in order to assess how much the trail recovered in a period of one year. As a result, three indicators were selected: trail grade or slope, number of non-official trails and exposed soil area.

The assumption that no significant changes should occur between different monitoring periods is one of the eligibility criteria for good natural resource indicators (Passold 2002). Given the lack of studies focused on data collection, Passold, Magro and Couto (2004) have tested the collection efficiency by comparing data obtained from two groups and within the same group of Intervalles State Park staff and biology experts. According to research criteria, only 10 of 26 possible indicators were able to be used in this area: bird watching and listening, vandalism in structures, rock painting, number of damage or writings trees, number of car sound perceptions, number of exposed rocks, erosion, trails depth, fauna traces, sanitation and littering issues. These 10 indicators were the most suitable for monitoring because they did not present significant differences between the specialists (biology experts) and park staff. Additionally there was a non-significant difference between individuals from the same group of evaluators.

Usually, Brazilian researchers don't discuss information about trail location. For Kabashima et al. (2015) this situation demonstrates how difficult it is to assume visitation is a direct cause of trail impacts. Out of the 14 papers mentioned by Kabashima et al. (2015) (Binelli, Pinho and Magro 1997; Bonatti et al. 2006; Carvalho et al. 2000; Maganhotto et al. 2007; Magro 1999; Passold 2002; Passold 2008; Ribeiro, Ramos and Silva 2007; Rocha et al., 2007; São Mateus, Silva and Ismerim 2008; Sardinha et al. 2007; Souza and Martos 2008; Takahashi 1998; Vashchenko Biondi e Favaratto 2008), only Passold (2008) says the trail under study was planned for public visitation. Concerning trail use history, Magro (1999) mentions the use of mules and horses for local people and goods transportation in the only long-trail in Itatiaia National Park. In 1949, 1,460 animal trips carrying heavy materials to build a hut at the Park higher's area occurred, causing severe erosion that is still visible today.

CONCLUSION

Monitoring recreational use impacts instead of calculating a so-called carrying capacity is a more effective alternative for Brazilian protected area

management, providing information about trends in the ever-changing environmental and social condition in each natural area. For Hammit and Cole (1998), monitoring also allows for assessing management programs and effectiveness of actions, as well as identifying places where changing or adding management actions are needed.

On the other hand, Brazilian recreation ecology studies need to prioritize the establishment of basic knowledge that may act as a basis for monitoring programs. Examples of basic information that should be more investigated in Brazil include: recreational influences on wildlife, especially aquatic fauna (see for example the Vidal et al. chapter in this volume); vegetation and soil responses to visitors and horses; and the response of local people facing new tourism activities in the community.

Once programs can be organized, teams will have to be trained for data collection, identifying issues and presenting possible solutions (see McCool et al. for a description of a capacity building program which has included monitoring). This should be the ideal scenario if there is institutional capacity to take forward long-term public use monitoring programs. Brazilian institutions are still short on staff to be able to fulfill a complex agenda, which involves natural areas protection, structure maintenance, park management councils meetings, visitor management, financial plans etc. Long-term research is essential to identify the really significant impacts in terms of environmental quality and visitor's experience. However, funding agencies do not always prioritize these items and so, in the last few years not much knowledge has been produced in this specific area. That situation has increased the gap in tourism policies, norms and resolutions reflecting in deficient environmental monitoring programs.

With growing interest in visitation to Brazilian parks, Brazilian scientists conclude:

- Recreational carrying capacity as a management paradigm is still used in the country because of its simple and faster way to managing visitor flow;

- Quantitative indicators provided by carrying capacity is the answer to what most managers are looking for;
- As already seen in the literature, good indicators are quantitative, but their definition and application are not always possible;
- Monitoring physical conditions and visitor experience should be done in all natural areas used by tourists, as a key factor for maintaining ecological processes;
- Most impact indicators are being measured in a very subjective form;
- Measurements and assessments using recreational indicators are not similar when done by experts or by the park staff, whose results may not be conclusive or comparable;
- Indicators such as presence of watering holes, rocks or trees with damage and litter/trash are more useful to monitor management effectiveness than ecological conditions in the area.

Another important issue is organizing areas that are going through a tourism development process, whether this includes community-based or large-scale tourism. Some IUCN publications (Eagles, McCool and Haynes, 2002; Leung et al. 2014) are examples of initiatives that offer tools helping in economic, cultural and environmental aspects understanding, as a basis for planning tourism in protected areas.

Recreational use in natural areas connecting to tourism actions, is a great opportunity for the society to recognize natural ecosystems and their associated values and also a chance for local economic development. The Millennium Ecosystem Assessment (2005) acknowledges social-cultural benefits generated by humans interacting with their natural environment. Recreation is currently considered as one of the possible environmental services in natural areas. Finally, in natural areas there are ecological and social conditions understood by society and once threatened they need to be protected. Because the natural attributes and values could be lost in some level by touristic use, the same attributes and values should always guide new research and monitoring programs.

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Chapter 2

NATURE TOURISM RESEARCH IN BRAZIL: A PRELIMINARY SCIENTOMETRIC APPROACH OF THE LAST 20 YEARS

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ABSTRACT

Nature tourism and ecotourism research is a basic input for visitation management in protected areas. Ecotourism includes the minimization of environmental impacts; direct benefits for the conservation of nature and environmental awareness and these dimensions are often the main goals for managing tourism in protected areas. In this study, we analyzed, scientific articles on nature tourism in Brazilian tourism journals in the last

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20 years. We examined 205 papers, mostly case studies, by means of qualitative methods. Most of them were published in the last ten years, in one specific journal, the Brazilian Journal of Ecotourism. In spite of the frequent appearance of the term ecotourism in the papers, it is common to see its use as a synonym for nature tourism. Our examination found that review papers and quantitative analyses focused on testing ecotourism principles were lacking. They are important gaps that must be overcome in order to promote international reach of Brazilian research on nature tourism. Two thirds of case studies have dealt with protected areas, both strictly protected and sustainable use categories, mainly National and State Parks and Environmental Protection Areas, respectively. Other than the federal and state protected areas, urban parks and private reserves are also important places for research and visitation. From the results of this preliminary assessment, we conclude it is essential to promote a more diligent use of the term ecotourism, as well as leveraging research about the effectiveness of protecting nature and raising environmental awareness, besides monitoring the impacts and possible mitigation measures. Encouraging applied research is basic to better balance management practices and reach sustainable development goals for the conservation of nature in the protected areas through tourism.

Keywords: ecotourism, protected areas, conservation of nature, biodiversity

INTRODUCTION

Ideas related to sustainable tourism in natural areas have been found in the literature since the 1960's. In the end of 1970's, the theme gained greater voice among managers and scholars, which eventually evolved into the concept of ecotourism. At the beginning of the 21st century, Weaver wrote that while ecotourism was in its childhood, the concept was maturing quickly, particularly with respect to fundamental principles, thus reflecting the consolidation of this area of knowledge and research (Weaver 2001). Ten years ago, based on the international literature, we could already consider that ecotourism was reaching its teenage years, including the very questioning of its existence, sometimes influenced by external forces, but its identity was already well defined (Weaver and Lawton 2007). It is interesting to note that ecotourism originated from four different converging

movements, from the 1970's and 1980's (Lindberg and Hawkins 1999, Honey 1999):

- 1) On the one hand, the tourism trade started to realize the growing environmental impacts it brought with its activities, reflecting the diversification and segmentation of the market. Opposite to mass tourism, the idea of an alternative tourism, where one of the new segments would be nature tourism, and within it the ecological tourism, or ecotourism, gains space (Newsome et al. 2002).
- 2) On the other, there is the economic importance of tourism, and the demand for new destinations increased rapidly, particularly in developing countries and tropical regions, with countless natural and cultural richness. Hence, sustainable tourism, ecotourism, community-based tourism, and many other names related to the combination of tourism, sustainability and nature, have been claimed as a great economic alternative for the development of these nations (Honey 1999).
- 3) The third component affecting the increase of interest in ecotourism was people's desire to reconnect with nature. Motivated by the social, emotional, sporting, learning, self-recognition, or whatever reason, friends, mountain climbers, families, governments and different civil society organizations have promoted the idea that connecting with parks or green areas is a pleasant way to improve health and welfare. This movement became more robust initially in the USA, Canada, Europe, and then went on to other countries, including Brazil (Eagles and McCool 2002, Araujo 2007).
- 4) The fourth driver for ecotourism is strongly rooted in the reality of protected area (PA) management. In spite of being the most important cornerstone for the conservation of nature, providing many environmental services, and being the major nature destination attractions, PAs have always suffered from a lack of human and financial resources. Year after year, administration after administration, resources get less and less to the PA system, a common reality in many countries. This is added to increasing

challenges and threats which make reaching the main goals of a PA more difficult. Daily, but complex tasks, such as the protection of nature, participatory management together with relevant players and partners, and basic visitor care seem to be unreachable on an everyday basis, in most developing countries. Having said that, ecotourism emerges as a great promise, the solution for the sustainable use of protected areas, sorting out the lack of human and financial resources, and potentially contributing to the improvement of the quality of life of the surrounding populations (Bushell and Eagles 2007).

So, ecotourism came to be viewed as an answer to many of the needs of management and local people. This is how many countries started with ecotourism, but they have been touched differently by these four components along the course of evolving applications, depending on the country or region. In the academic world, ecotourism has gained shape, thus consolidating its pillars and becoming different from the other types or concepts related to tourism in natural areas (Blamey 2001, Buckley 2009). In this chapter, we do a preliminary review of the evolution of ecotourism concept, its principles and the research about ecotourism and nature tourism that has been conducted in Brazil. Although there has been a broad debate about the meaning of ecotourism in the academic world (Fennel 2001, Donohoe and Needham 2006), making it different from other types of outdoor tourism, there is still certain confusion in the interpretation of what in fact it represents. Many times it is confused with nature tourism, which is simply any touristic activity in natural environments (Newsome et al. 2002, Buckley 2009).

The conceptual origin of ecotourism is based on the relation between people and nature and it emphasizes the contributions for the conservation of natural environments and its biodiversity. Nevertheless, aside from the academic level, the term ecotourism is used much more broadly. For the touristic industry, it is associated with activities in natural environments and the advertisement of “green” products. For governments, it is usually the promise of a solution for all evils, from the reduction of poverty to the

protection of biodiversity, going through environmental awareness and education. For tourists, it can be something as heterogeneous as a car ride through a natural area up to participating in a scientific expedition in the “wild.” For NGOs, it is a conservation tool for supporting protected areas and local communities, usually around or inside these areas. (Pires 1998, Honey 1999, Weaver 2001, Buckley 2009, Wearing and Neil 2014).

Understanding ecotourism is also something influenced by the area of knowledge of the authors that write about the theme. Hence, in academic communities where the construction of knowledge about ecotourism and nature tourism had more contribution from researchers from the environmental areas, the greater focus is in the environmental aspects, i.e., more focused on the benefits for conservation of nature and visitation impacts or recreation ecology. And naturally, where the discussion of ecotourism is in great part done by researchers in the social sciences, the emphasis is on the social aspects, focused on human populations inhabiting these natural areas. These different influences are clear in course books and scientific papers, what at times contributes some confusion on the robustness of the concept, and its overlapping and differentiation to similar concepts. Nevertheless, after going through the epistemological swamp of its teenage years, ecotourism has been reassuring its identity (Fennel 2001, Donohoe and Needham 2006, Weaver and Lawton 2007). And once a definition is set, it becomes possible to delve into more specific studies, revealing the patterns and understanding the processes related to its fundamental characteristics. But the challenge becomes even greater, because nature tourism and particularly ecotourism, is a complex and multidisciplinary phenomenon (Ceballos-Lascuráin 1999), or better, cross-disciplinary. In other words, although it has established its identity, ecotourism must enter the adult life reassuring its principles, and needs to necessarily touch and maintain a dialogue among the several areas of theoretical and practical knowledge.

In the 1990s, while experienced adventure travelers found out and recommended a new destination each day, travel operators and agencies would sell more and more packages to aspiring ecotourists. And the destinations, before unknown to most, would be full in the blink of an eye. At the same time, in the academic world, the definition of “ecotourism” was

being exhaustively debated (e.g., Goodwin 1996, Pires 1998, Fennel 2001, Weaver 2001, Donohoe and Needham 2006, Weaver and Lawton 2007). Finally, after decades of debate, and likely more than a hundred definitions (Fennel 2001), we can consider there are four fundamental or basic features of ecotourism: (1) it occurs in natural environments; (2) it minimizes the environmental and social negative impacts, (3) it provides direct benefits for the conservation of nature, and (4) it promotes environmental awareness. It is common to find authors that advocate that benefits for local communities must be themselves another core component. But although it is very relevant and strategic, and must be considered in all tourism initiatives that favor sustainability, it must not be considered a feature that differentiates ecotourism from other forms, since many other concepts and segments mention communities as a core attribute. In ecotourism, the core aspect is to ensure direct benefits for the conservation of nature (Honey 1999, Buckley 2009) in their several expressions, such as environmental services, the scenic beauty, the species, with special attention to the rare and endangered; the biological communities, the habitats and ecosystems.

Nevertheless, to reach these goals, we need to understand that ecotourism is a component of a larger concept which we term nature tourism, or nature-based tourism or natural area tourism (*sensu* Newsome et al. 2002), or yet Nature Eco and Adventure Tourism – NEAT (*sensu* Buckley 2009). This larger concept encompasses many other segments such as adventure tourism or scientific tourism, when referring to the touristic industry, or many other concepts, such as geotourism, sustainable tourism, community-based tourism, green tourism as mentioned among scholars (see Buckley 2009). With the spread of several activities, segments and concepts, understanding nature tourism is a challenging task. In this work, we adopted four main types of the larger concept of nature tourism: ecotourism -ECOT, adventure tourism - ADVTUR, wildlife watching tourism – WLDLIFE, and nature appreciation/contemplation tourism – NATOUR.

The objective of this study is to analyze the production of knowledge about nature tourism with special emphasis on ecotourism in the last decades in Brazil. Hence, we have made a scientometric approach, by categorizing and quantifying the works published in the main scientific tourism journals

in Brazil. Initially, we present a brief history about the development of the research on tourism in Brazil and its main scientific journals. Then, we have described how the data were collected, with the identification of 205 papers on nature tourism published in the last 20 years in the most important journals in the country. Finally, we present and discuss the results regarding the types of papers written, the main themes, the methodological approaches, the types of nature tourism studied, as well as the use of the term ecotourism. With that, we wish to preliminarily systematize and summarize how much is known about nature tourism as published in Brazil and make observations about the knowledge gaps and the implications for visitation management in protected areas.

THE DEVELOPMENT OF TOURISM RESEARCH IN BRAZIL

Tourism is a field of study with contributions from several areas, and each brings a framework and uses its own methods and tools for data collection and analysis. Research on tourism in Brazil is still quite recent (Leal 2006), and it slowly grows into a more defined scientific area, with interdisciplinary aspects and builds its own methods and concepts. In order for science to advance, aside from the academic courses, scientific publications play an important role. More and more, scientific journals are a source of inspiration for more research and references for teaching, for policy-making, and for promoting the dissemination of highly qualified and duly revised information.

Historically, in the academic world abroad, some of the major tourism journals are (year of establishment-end): *The Tourist Review* (1946) currently called *Tourism Review*, *Journal of Travel Research* (1968), *Annals of Tourism Research* (1973), *Tourism Recreation Research* (1976), *Tourism Management* (1980), *Estudios y Perspectivas en Turismo – Revista Latinoamericana de Turismo* (1991), *The Journal of Tourism Studies* (1990-2005), and most recently *Journal of Sustainable Tourism* (1993), *Current Issues in Tourism* (1998) and *Journal of Ecotourism* (2002).

In Brazil, the first two tourism scientific journals were established in the 1970's; another five journals or magazines also were published, with statistics and news about tourism. After 2000, there was a considerable increase in the number of scientific journals in Brazil, and with the advance of technology, they also went online. Between 2000 and 2007 there were 16 tourism journals in Brazil. In 2007, only nine remained active (Rejowski and Aldrigui 2007). In the beginning of this decade (2010's), they consolidated into the main scientific tourism publications in Brazil: *Turismo Visão & Ação* (1998), *Caderno Virtual de Turismo* (2001), *Revista Científica Eletrônica de Turismo* (2004- 2012), *Revista Brasileira de Pesquisa em Turismo* (2007), *Revista Brasileira de Ecoturismo* (2008), *Turismo e Sociedade* (2008) and *Revista Turismo em Análise* (1990). Just as in the rest of the world, many new journals appeared and may or may not be consolidated into the academic world in the future.

The scope of the above mentioned journals almost always includes a multi or inter disciplinary approach in order to bring an understanding of the touristic phenomenon. Nevertheless, one can perceive a dominance of the social sciences when reading these journals, usually described in the journal's scope, as available on their websites. This is the case because the entities in charge of these publications, graduate course programs mostly from Brazilian public universities, are more related to the social areas. Just as with tourism graduation courses, these institutions are located mostly in the South and Southeast of Brazil. Journals are published every three, four or six months.

There is fantastic opportunity and great need to internationalize research and knowledge produced in the country. Brazilian journals on tourism still publish most papers entirely in the Portuguese language, different from other areas, such as biology and conservation science, where most papers and Brazilian journals are entirely published in English, for greater visibility and reach of their content. Moreover, there are very few papers published in tourism journals in Brazil that rely upon literature published in the major international journals in this area. Hence, it is important to systematize and analyze the types of studies about tourism and, particularly about nature tourism, which have been produced in Brazil. Hence, it is possible to identify

conceptual approaches, as well as methods, themes, possible trends and gaps, in order to encourage the development of this area in Brazil. Also, the exchange of knowledge with the international scientific community will be made possible, going after solutions to real problems towards reaching the principles of ecotourism in Brazilian protected areas.

THE PRODUCTION OF KNOWLEDGE ABOUT NATURE TOURISM IN BRAZIL: HOW DID THIS STUDY COME ABOUT?

The scientometric or bibliometric investigation method has been chosen to quantify the academic production about Nature tourism (NT) in Brazil. Hence, the sample universe for this research was the tourism scientific journals published in Brazil in the last 20 years, from 1996 to 2015.

All journal volumes of *Caderno Virtual de Turismo (CVT)*, *Revista Científica Eletrônica de Turismo (RCET)*, *Revista Brasileira de Pesquisa em Turismo (RBTUR)*, *Revista Brasileira de Ecoturismo (RBECO)*, *Revista Turismo e Sociedade (RTS)*, and *Revista Turismo em Análise (RTA)* from 1996 to 2015 were assessed. Journal websites were checked, and the table of contents of each volume as well. We have chosen all papers whose titles include the environmental theme, with the words (e.g., ecotourism) or roots (e.g., ecot) such as: natural areas, protected areas, protected areas, indigenous lands, environmental interpretation, environmental education, wildlife, fauna, flora, trails, environmental impacts, environment, conservation, species, sustainability, adventure tourism, nature tourism, ecotourism.

Papers chosen were read in full and classified according to the following variables. *Type of article*: (1) Review, (2) Conceptual/ Forum, (3) Qualitative case study, (4) Quantitative case study. *Central theme*: (1) Case Study – generally describing tourism development in a destination or initiative, (2) Discuss concepts, (3) Approaches and tools for the Planning and Public Policies, (4) Environmental Education and Training, (5) Human

Communities and Traditional Populations, (6) Visitors - Profile, Satisfaction, Motivation, (7) Environmental impacts of Tourism/Visitation, (8) Conservation of nature. *Type of Tourism*: (1) Ecotourism, (2) Fauna and Flora Watching Tourism, (3) Adventure Tourism, (4) Nature contemplation tourism. As applicable, *Type of protected area*: (1) Strictly Protection – categories I through III of IUCN, (2) Sustainable Use– categories IV through VI of IUCN, (3) other categories (outside the IUCN), and (4) Indigenous lands. *Level of administration in the protected area*: (1) Federal, (2) State, (3) Municipal, or (4) Private.

We have also assessed the use of the term *ecotourism* in each one of the papers read, and their 'fitness to the major characteristics mentioned in the academic literature: (1) a nature destination, (2) where the impacts of tourism must be minimized, and should have (3) environmental awareness as priority, and, above all, (4) the direct benefits for the conservation of nature (Fennel 2001, Donohoe and Needham 2006, Buckley 2009). At times, it was a challenge to assess how the term ecotourism was used by the authors. In many papers, they mentioned the definitions of ecotourism, which consider these principles, such as the definitions of The International Ecotourism Society (TIES 1990, 2016) or the Ministry of Environment and Ministry of Tourism of Brazil (Brazil 1994). Nevertheless, despite these citations, in other parts of the papers it was common to see the term ecotourism without an actual reference to any of these principles. Three situations were more frequent regarding the use of the term: (i) the definition is cited/transcribed, but authors show an inclination to discuss the consequences for local human populations, and the basic ecotourism features, mentioned above, are not considered in depth, (ii) the definition is cited or not, and its principles are not discussed or mentioned along the text, and (iii) the definition is cited or not, but the term ecotourism is used as a synonym of nature tourism, without touching on the principles. The other situation, not as frequent, was the use of the term properly, usually followed by the citation (e.g., TIES 2016, Brazil 1994), discussing its principles, and in a few cases even assessing or testing the meeting of these basic principles.

TIME RANGE EVOLUTION OF NATURE TOURISM PAPERS IN BRAZILIAN JOURNALS

Between 1996 and 2015, there were 205 nature tourism papers published in Brazil. Until 2005, the number of papers published was extremely low, not going over four or five per year, considering the four main journals at the time (*CVT*, *RCET*, *RTS*, *RTA*). Afterwards, with the launching of *RBECO* in 2008, the number of papers grew rapidly. In 10 years, the number of papers published increased eight times, going from 6 in 2004-2005 to 49 in 2014-2015. Besides *RBECO*, *RCET* also contributed to the increase in the number of papers published on the theme, until it suspended publication in 2012. *CVT* and *RTA*, since 2004-2005, kept publishing a reduced but steady number of papers on nature tourism (Figure 1). After 2012, the number of articles tripled in *RBECO*, and *RBTUR* and *RTS* started publishing articles related to the theme. Even considering the period in which all journals were already active, after 2008, it is remarkable the increase in NT papers. *RBECO* is the one that published the most, leading this increase. In the first four years of existence, from 2008 to 2011, *RBECO* concentrated 30 to 35% of papers on nature tourism, and in the last years, and from 2012 to 2015, 60 to 65% of the total articles published were in this journal.

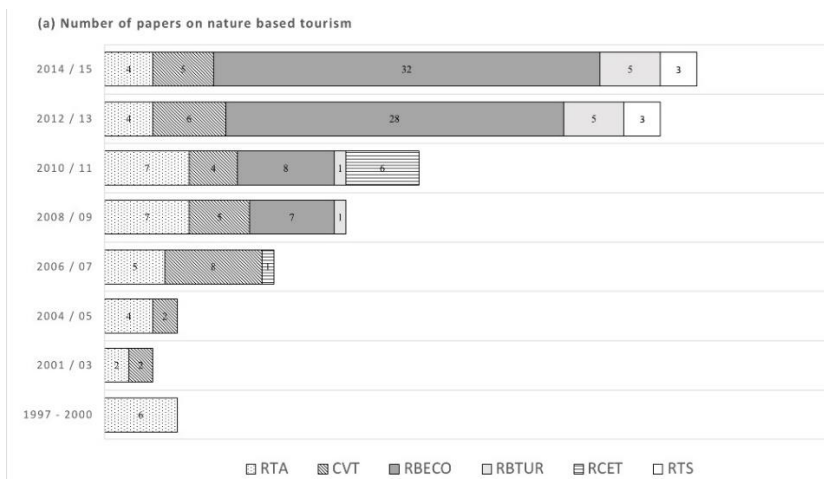


Figure 1. (Continued)

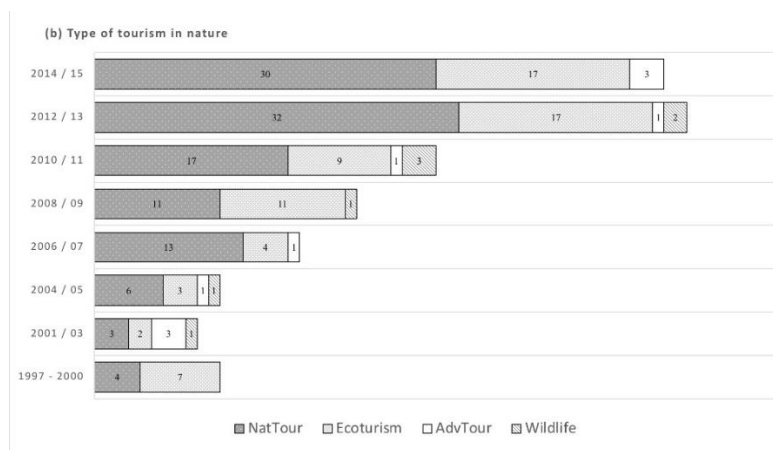


Figure 1. Number of papers on nature tourism published in the main Brazilian tourism journals, from 1996 to 2015. (a) time range evolution of papers on the theme in the different journals studied (*Caderno Virtual de Turismo - CVT*, *Revista Científica Eletrônica de Turismo - RCET*, *Revista Brasileira de Pesquisa em Turismo - RBTUR*, *Revista Brasileira de Ecoturismo - RBECO*, *Revista Turismo and Sociedade - RTS*, e *Revista Turismo em Análise - RTA*). (b) time range evolution of the studies on the distinct types of nature tourism: NatTour – nature contemplation tourism; Ecoturism; AdvTour- Adventure Tourism; Wildlife – Wildlife Tourism.

TYPES OF NATURE TOURISM RESEARCHED IN BRAZIL

The studies about nature tourism in Brazil have been mostly developed during the last ten years. During this period, there has been growing demand for the products connected to nature by tourists. This has led to the diversification of the market, with new segments, tens of activities and hundreds of new destinations in the last decades, particularly in tropical countries such as Brazil. Adventure and wildlife watching tourism are more and more demanded as part of the tour packages. So, one could expect the academic production of knowledge on nature tourism would follow along this specialization and segmentation. As a matter of fact, the number of studies referring to ecotourism shows a four-fold increase from 2005 and 2015, and the papers on nature tourism in general have doubled. Nevertheless, the works on adventure and wildlife watching tourism are still rare. Between 2000 and 2005, four papers on adventure tourism and two on

wildlife watching tourism were published. Ten years after, between 2010 and 2015 ten papers were written specifically about these two themes. And, these studies are less and less frequent, thus representing 23% of the papers published from 2000-2005, and only 7% between 2010 and 2015 (Figure 1b).

NATURE TOURISM THEMES AND TYPES OF PAPERS IN BRAZIL

Many themes related to tourism and natural areas have been studied in Brazil in the last 20 years (Figure 2b). Until 2005, there were few papers and a more equal distribution among the themes and goals of the studies, which were focused on the discussion of concepts; public policies and planning; visitor profile; tourism relations with local communities; and case studies. Nevertheless, in the last ten years, we notice case studies have been more frequent (Figure 2b). In these papers, authors usually describe the development of tourism in a natural destination and speculate consequences for local populations and seldom about environment. Based on direct observation, document analysis and using semistructured or open interviews they discuss the relation of tourism with the communities or protected areas. However, studies focused on planning and public policies, the relation of NT with local communities, and the importance and efficacy of training, awareness and education initiatives, as well as issues related to the visitor perception and satisfaction, have shown slower growth in the last 10 years (Figure 2b). The number of papers discussing the concepts of NT have been dropping. This likely reflects the process of maturity of this area of knowledge in Brazil, and the consolidation of concepts, as well as a growing demand for more evidences and data, more than reflections about ideas and concepts. It is interesting noting the number of publications whose goal has been specifically one of the basic principles of ecotourism: (1) nature destination, (2) minimization of impacts, (3) environmental awareness, and (4) direct contribution for the conservation of nature (see introduction). Themes such as environmental impacts, or the conservation of biodiversity

are still scarce, representing less than 5% of the papers published in the last few years (Figure 2b). Studies on environmental awareness are also rare, even considering the papers we have counted herein (Figure 2b, environmental education and capacity building), encompasses works that are purely conceptual, case studies relating the visitation to environmental education processes, and others related to the training of outfitters, guides and undergraduation and primary school students.

Hence, we conclude that despite the large number of works that use the term “ecotourism” in their title, representing almost half of the works published about nature tourism in Brazil in the last 20 years, few in fact delve into the fundamentals of ecotourism. The advancement of nature tourism research, particularly ecotourism, focused on applying and testing its principles is fundamental to moving away from this “epistemological swamp.” The most diligent use of the term by researchers must also be followed by the ownership and application of its real meaning in the management of PAs or the attractions in nature tourism, with special attention to the importance of ecotourism for the preservation of nature and environmental awareness.

Most papers published on NT in Brazil have been qualitative cases, representing 70% of the papers in the last period (2014–2015). These works have used document analysis, direct observations, semi-structured interviews, photographs and other methods of social sciences. On the other hand, about one fourth of the papers assessed have been classified as quantitative case studies. These are considered as those which have involved statistical analysis, such as visitor profiles, environmental education, quantitative methodologies for planning tourism in natural areas, and a few works quantifying environmental impacts. Therefore, the number of papers within the realm of sciences such as biology, environmental or forest engineering is low. Opinion or discussion works still have considerable space in the literature about NT in Brazil. Review papers are extremely rare. Considering the vast academic literature on NT already produced in Brazil, it is important for us to be able to advance also in synthesis, with review works, and so we can access accurately the state-of-the-art and the gaps in knowledge for research and management.

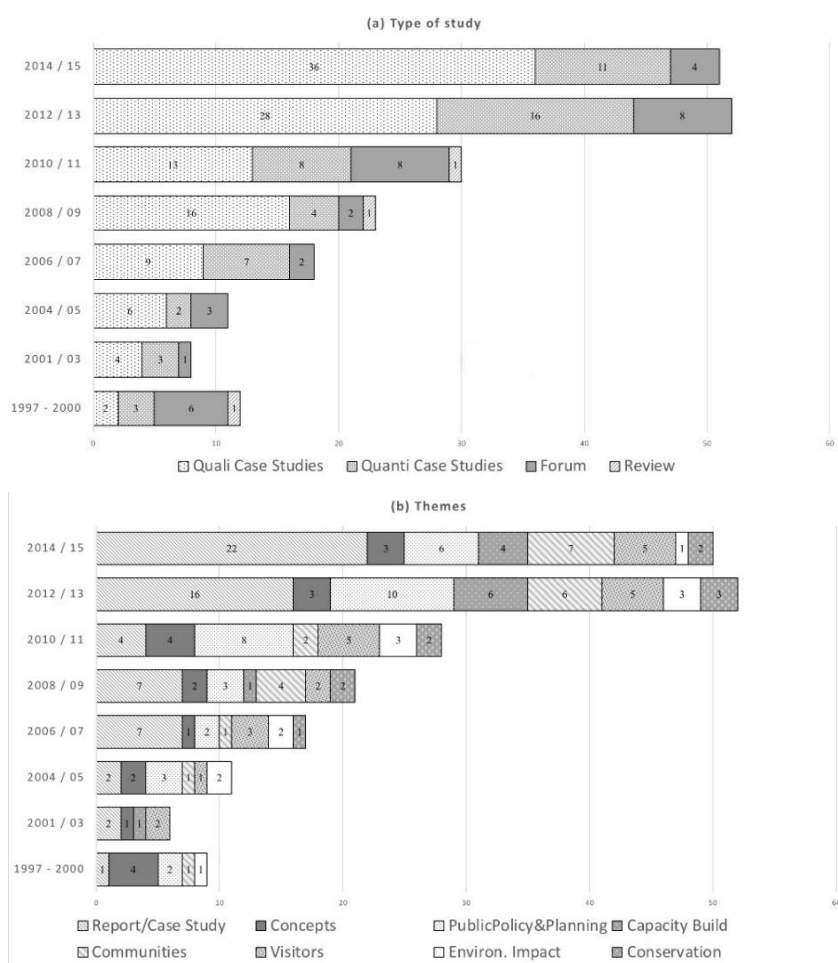


Figure 2. Types and themes of papers on nature tourism published in Brazil in the last 20 years in tourism journals.

RESEARCH IN NATURE TOURISM AND PROTECTED AREAS IN BRAZIL

A few years ago, some discussions about nature tourism, and particularly about ecotourism, used to mention this type of tourism would take place exclusively or preferably in preserved, pristine or protected areas

(Wearing and Neil 2014). Currently, we know ecotourism can take place in a broad range of green areas, including urban ones, but always seeking its principles. Nevertheless, the importance of protected areas for nature tourism, and vice-versa is unequivocal and must be treated with special attention. This is especially true because when we implement *Ecotourism* we will be immediately contributing to reaching the protected areas's goals. Among them, there are 170 studies *in loco* about nature tourism in Brazil, 106 (62%) of them have been conducted in some protected area, mainly those called Conservation Units in Brazil, equivalent to the IUCN categories. In 11 studies many PAs were assessed and when they were not specified or identified, they do not appear in Table 1.

Conservation Units (UCs) are the protected areas where the studies *in loco* are the most frequent; 86 of the 95 studies in protected areas took place in these territories. Strict protection UCs (UCPI) or strictly PA are those in which biodiversity is in its higher level of integrity, including species, ecosystems, ecological and evolutionary processes. Therefore they are the most important PAs, keystone areas of the strategies for nature conservation. These are also the most important territories for developing research on nature tourism, encompassing 73% of all works developed in UCs, encompassing national and state parks, such Tijuca National Park and Iguaçu National Parks. The increasing publication numbers probably also reflect the larger flow of visitors in these parks, which has been growing recently. Out of the 23 studies on nature tourism done in federal UCPI, 22 were in national parks, and out of the 32 in State UCPI, 31 were in state parks.

In the sustainable use UC group (UCUS), out of the 13 studies in federal UCUS 11 were in APA out of 11 state UCUS, 10 were in APAs, the Environmental Protection Areas (APA), equivalent to category V of IUCN. This category is frequently considered as a lower level of protection (Jekkins and Joppa, 2009), sometimes not reaching sustainable management of natural resources. Nevertheless, for research on tourism, and likely for the flow of visitors and touristic development, the importance of this PA category is extremely high. For the studies related to tourism in Brazil, the

APAs represent a full range of relations among humans, nature and tourism. For the tourism market and for sustainable management, or less predatory management of natural resources the APAs mean an excellent opportunity to develop the industry of sustainable nature tourism. It allows freedom of action for the private sector, the communities and other sectors of the society, at the same time it gathers the interest, at least partially, of the players involved for the protection of scenic beauty and other cultural services provided by nature and explored in tourism. So, it is possible to establish a win-win situation, where the tourist industry and the conservation of nature can have positive feedbacks or direct benefits.

Table 1. Number of studies *in loco* about nature tourism done in protected areas, published in tourism journals in Brazil in the last 20 years (1996-2015)

IUCN Protected Area Category	Federal	State	Municipal	Private	All
Strictly Protected (IUCN I-III)	23	32	2	5	62
Sustainable Use (IUCN IV-VI)	13	11	2	5	24
Green Urban Spaces	13	11	8	5	8
Indigenous Lands	1	11	8	5	1
All	37	43	10	5	95

An example is the Project Neutral Carbon Tourism, which gathers about 150 business persons and 80 communities from the *APA Serra Grande* in Itacaré, on south coast of Bahia state. Businesspersons and NGOs provide grants and training so that the local dwellers can change their agricultural practice, abandon slash and burn, stop hunting and deforesting, plant trees and keep their children in school (Seehusan et al. 2011). It is basic that the different sectors of the society, and particularly the public authority and the business sector, all make an effort to promote and keep initiatives of this kind. It is just as needed to have applied research responding to relevant questions for tourism management in the PAs, reaching the conservation of nature and sustainable tourism in these territories.

CONCLUSION

The increase in the number of scientific publications in Brazil about Nature Tourism and particularly about ecotourism was remarkable in the last decade, with an important contribution from a journal dedicated to the theme. The papers published about Nature Tourism are mainly focused on qualitative approaches and description of case studies. Review and quantitative studies are still rare, as well as those from environmental sciences. Although there is a growing number of studies on ecotourism, the investigation of its basic principles is still rare in Brazil. The production of scientific knowledge has not been following the market diversification of nature tourism in the last few years. If that is not the case, then these studies have been published in other journals.

In Brazil, research must be encouraged about the positive and negative impacts of tourism, visitor and dweller environmental awareness, inside and surrounding the protected area, and also about the contribution of tourism for the conservation of biodiversity. This is also true for the assessment of these themes in different or specific segments of NT, such as adventure tourism and its tens of activities, wildlife watching tourism, education and scientific tourism etc. It is important to promote multi and cross disciplinary studies for understanding the phenomenon of tourism in many natural areas. Research that makes use of quantitative methods, in general with greater volumes of data, hypotheses tests, and statistical analyses (*sensu* Barros et al. 2015), such as studies testing quantitative indicators for sustainability (see Buckley 2012) can all be quite useful to allow extrapolations and support decision-making. Considering the lack of these approaches and themes, it becomes evident the need to incentivize studies and papers that can promote them, what will contribute for increasing the management of tourism in protected areas (Goodwin 1996). Research dedicated to understanding what the tourism industry does, how and why it may contribute for development strategies, regulation and incentives, and therefore for reaching the sustainability outside the academic world (Buckley 2012). Research on nature tourism in Brazil is baby-stepping and should keep its focus along the way. Aside from advancing in the

systematization of the knowledge already produced, we must fill the gaps and broaden the dialogue with experts from other countries so that we can advance in research and management of tourism in natural areas.

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Chapter 3

PARTNERSHIPS FOR DEVELOPING TOURISM IN NATIONAL PARKS

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ABSTRACT

The involvement of the private sector in the development of tourism in national parks has been advocated among policy-makers as one of the ways to strengthen public use in these areas, considering environmental conservation, the generation of revenue to support management, social and economic engagement of local communities. Based on this assumption, this chapter aims at assessing and discussing the benefits and challenges related to the participation of the private sector in tourism activities in Brazilian national parks, based on three major pillars: the legal and

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institutional framework; the definition and elaboration of partnership instruments; and the partnership management and monitoring process. As of November 2016, there were 73 national parks in Brazil, managed by the *Instituto Chico Mendes de Conservação da Biodiversidade* (ICMBio – Chico Mendes Institute for the Conservation of Biodiversity), each with its own managerial challenges and different levels of implementation. In order to establish such partnerships, ICMBio makes use of legal instruments, such as concession contracts, permissions, and authorizations so that public and private institutions can enter into partnerships for promoting public use, as well as other activities to support their management and protection. The chapter starts with a conceptual outline on the major arguments and principles that guide the discussions about the relation between the public and private sectors in developing tourism. After, from the assessment and analysis of primary and secondary data regarding the dynamics of visitation to Brazilian national parks, we present a discussion on the process of elaboration and monitoring of partnerships. The analysis of the information collected shows the establishment of partnerships increases the responsibilities that have to be undertaken by ICMBio when managing protected areas. The first main challenge remains to provide minimum human resources and physical structure in national parks. Finally, one should mention that the theme partnerships has been taking on a leading role in the management of national parks and other protected areas, especially when it comes to strengthening the role of tourism in supporting the environmental conservation and the generation of benefits to the society.

Keywords: public use, concessions, management, protected areas, partnerships

INTRODUCTION

Tourism in protected areas has been advocated among policy-makers in several countries as a strategy to reconcile the conservation of biodiversity, the social awareness regarding environmental issues and the development of economic options that can benefit the maintenance of these areas and the quality of life of local populations (Eagles and Hillel 2008; Buckley 2012; SCBD 2015).

Among the strategies used for promoting tourism in national parks, authors such as McCool (2009); Wyman et al. (2011) and Thompson et al.

(2014) mention that the establishment of partnerships among the public and private sectors have been taking on a leading role in the current visitation planning and context in protected areas. It should be noted the planning, implementation and monitoring of partnerships between public and private institutions are always a challenge, given the fact that this relationship is aimed at gathering different interests towards reaching common objectives, which in the case of tourism in protected areas should start with the conservation of the environment and public use activities with the proper customer service and environmental sustainability.

Based on these statements, the main goal of this chapter is to analyse and discuss the participation of the private sector in developing tourism activities in Brazilian national parks. We will discuss issues such as the different institutional arrangements for establishing partnerships adopted at *Instituto Chico Mendes de Conservação da Biodiversidade* (ICMBio – Chico Mendes Institute for the Conservation of Biodiversity), the agency in charge of national parks and other federal protected areas.

In order to achieve these goals, this chapter presents at first a conceptual framework about the main concepts and principles that guide the discussion on the relationship between public and private sectors in developing tourism. The literature review also includes the role and policy about concessions and partnerships. Afterwards, based on the gathering and analyses of primary and secondary data on Brazilian national parks visitation, an overview is presented on the ongoing and future partnerships in these areas.

BUILDING THE THEORETICAL- METHODOLOGICAL FRAMEWORK

This section involves reviewing the literature and theory about partnerships with public agencies. A variety of articles and academic papers have discussed this topic (McCool 2009; Moore and Weiler 2009; Wyman et al. 2011; Rodrigues 2009; Braga 2013; Rodrigues and Godoy 2013) which emphasizes the development of activities that support tourism in protected

areas. Other articles and official reports refer to policies and guidelines, both domestic and international, which guide the establishment of partnerships for having tourism in protected areas (Ministério do Meio Ambiente 2006; Thompson et al. 2014; World Bank 2016).

Wyman et al. (2011) form the basis for the methodology used for such arguments. According to the authors, a concession process consists of three principal structures: 1. Legal framework and policies that guide the concession contracts and highlight best practices in which these contracts must be defined and regulated; 2. Concessions Request For Proposal (RFP) and documentation development process, which define the way they will be shaped, including their format, values and market-based information and service operations and 3. Contract management and follow-up, which specify best practices that must be adopted by concessionaires. Based on these components, these authors have mapped the best practices in tourism-driven concession processes in 22 countries.

This chapter will introduce the discussion on the components listed by Wyman et al. (2011), from the experience observed in the concession processes and other partnerships in Brazilian national parks. Hence, secondary information was gathered among the documents, made available by the *Coordenação Geral de Uso Público e Negócios* (CGEUP - General Coordination for Recreation and Public Use Services/ICMBio/Brasília), about ongoing concessions in national parks, and research done on the theme. One should note the information and analyses disclosed in the study conducted by Carrillo and Catapan (2015) aimed at providing for the elaboration of guidelines and strategies to enter into partnerships was also critical for this chapter.

PARTNERSHIPS IN PROTECTED AREA MANAGEMENT: LEGAL AND INSTITUTIONAL ASPECTS

Li and Akintoye (2003) mention that in many countries public-private partnerships are widely recognized and offer a long-term approach to

promote social infrastructure, trying to strengthen the value of public goods and lead to a better use of the taxes paid by citizens. For the authors, the main goal of partnerships is to make use of the private sector's economic growth knowledge in order to provide services and infrastructure in a more efficient way. The authors mention partnerships may be developed in several formats and sizes, what makes it harder to group them in a single, consistent "one size fits all" model.

As highlighted by Peters and Pierre (2010), public-private partnerships are sometimes treated as the epitome of "new governance", representing the fusion of resources of many sectors of society towards common goals. That would also mean a modern strategy built by governments to solve issues in public management. Nevertheless, they mention partnerships involve complex issues such as control, transparency and accountability (p. 42).

It should be noted that common and collective objectives will involve different interpretations, especially in the environmental area, which is filled with issues such as right of access and heritage protection of public goods. When discussing the meanings of "public" in the access to tourism services in national parks, Rodrigues and Irving (2016) note the term public can be interpreted from three ways: the ownership regime, related to the public good of special use; the state-related affairs, regarding the role of the government in delegating the use of public goods and the delivery of public services; and the scale of society values (heritage, collective interests). These dimensions reinforce the importance of the public role of protected areas, in terms of nature conservation and the provision of ecosystem services to the society, which explains the basic assumption for the definition of common and collective objectives regarding partnerships.

In Brazil, especially after the end of the 20th century, a set of policies and guidelines were disseminated and as a result, they implied the need of having a new role for the government. It entailed actions that would not be only restricted to the direct delivery of services to the society, but would also see the government as an incentivizing or partnering agent to the private sector's entities providing services that interest the population (Furtado 2007, 33).

Following this trend, Bresser-Pereira (2007) mentions that after the 1990s, a public administration reform process started in the country, aimed at making the government more efficient when guaranteeing social rights, by means of the provision of education, health, social security and welfare services to the society.

Based on this change in policy, the change in providing public services has influenced several sectors of policy-making, including environmental ones. In 1999, the *Instituto Brasileiro de Meio Ambiente e Recursos Naturais Renováveis* (IBAMA – Brazilian Institute of Environment and Renewable Natural Resources), at the time in charge of managing federal protected areas, published the paper “*Marco conceitual e diretrizes para terceirizações administrativas em unidades de conservação – Conceptual framework and guidelines for contractors in protected areas*” (IBAMA/GTZ 1999).

In terms of policy-making, Law 9.985, as of July 18th, 2000, established the National System of Protected Areas (SNUC) which formalized the authorization for providing goods and services inside protected areas. Therefore, the government may delegate the private use of a public good so that the private sector provides certain visitation-related services (Braga 2013). This administrative license is based on the legislation regarding the use of a public good and public services (Law 8.987/1995, known as the Concession Act, for instance), although visitation-supporting services in national parks are not considered public services in its strict sense (Rodrigues and Godoy 2013).

Particularly regarding protected areas, the Work Group for Protected Areas of the Convention on Biological Diversity (CBD) has produced a paper called “Programme of Work for Protected Areas” (UNEP/CBDB 2007), with guidelines to streamline different alternatives to strengthen the implementation and management of protected areas. This paper tried to systematize the innovative mechanisms for developing public and private partnerships as a potential alternative to support the funding for managing protected areas.

Moore and Weiler (2009) understand the collaboration between the public and the private sectors is a response to the limited capacity, to the

reduction of services and to the reduction of the budget for managing tourism in protected areas by the public sector, as well as to the different management demands.

The need to invest and to optimize the spending of resources and the continuous reduction of public expenditure in protecting the environment are arguments used by the public authorities and the private sector for promoting a partnership model to be implemented in protected areas. The intention is to strengthen partnerships as an alternative to support reaching the goals of protected area management. However, as mentioned by Rodrigues and Godoy (2013), the concession of services implies broadening governmental law enforcement because of the complexity of contracts and the administration of such contracts and partnerships require strong public institutions, with trained staff and management, as well as monitoring capacity. This means that at the same time support is sought from the private sector to meet the demands for financial and personnel resources, the public authority needs to be properly structured in order to be able to manage the contracts in an appropriate manner.

Besides the partnerships with the private sector, in Brazil there is a process of strengthening the organization of tourism-related businesses, featured as “community-based”, and led by local communities. This process is placed at the core of the debate regarding the visitation service delivery in national parks (Botelho and Rodrigues 2016).

Building partnerships in protected areas is a complex process because it involves different sectors such as the civil society, local communities, the private sector, universities, etc. Each group of players has different interests that must be taken into account in these partnerships; building the common interest that brings the players together is a major challenge. This process is not simple and requires planning and very clear institutional and governmental guidelines. This is why management entities build partnership guidelines and promote planning with participation and in line with protected areas’ goals. For instance, one of the features for the success of the concession program, according to the World Bank (2016), is that conservation must be put first, with the disclaimer that some areas are not suited for tourism.

McCool (2009) highlights that with rapid growth in the flow of tourists in the last ten years of the 20th century, and the diversification of demand, planning tourism in protected areas requires increasing participation from the touristic trade. The author mentions that partnerships in their many forms are an important tool for building the public interest, for they may promote the knowledge and needed accountability for developing and implementing timely actions with the place and in line with the objectives of the protected areas.

Within ICMBio, delegating visitation-supporting services has the improvement of visitor experiences in protected areas as one of its main goals. Another direct benefit of delegating these activities is its implementation through tourism-specialized market sectors. The lack of public financial structure or staff resources for conservation is also mentioned as a reason to defend these delegations. So, when public use is planned and monitored properly in protected areas, it could be a relevant tool for conservation to streamline resources to support the management of these areas and to implement labor and income alternatives for the local population.

Hence, when trying to improve the implementation of protected areas in Brazil, some institutional arrangements (concession, permission, authorization, etc.) are used by ICMBio in order to perform partnerships with public and private institutions. Carrilo and Catapan (2015) have identified 13 different legal arrangements for partnership between ICMBio and the private sector, amongst which we find: technical cooperation agreement, concession, permission, authorization, term of reciprocity, covenants, etc.

It is important to note that there is currently no specific legislation (norms, rules and regulations) precisely related to concessions in protected areas (Rocktaeschel 2006). ICMBio has been using the legislation that regulates the concessions and tendering processes for public services in Brazil, such as highways, ports, airports and other public areas to administer these partnerships and concessions in protected areas.

Hence, ICMBio started in 2015 to improve its guidelines and the specific mechanisms for establishing the partnerships with the private sector. This

process has been implemented with the support of the Inter-American Development Bank (IDB), the Socio-Environmental Fund of the Caixa Economica Federal Bank and the Brazilian Institute of Municipal Administration (IBAM), with a project named the “Environmental Public-Private Partnerships (PAPP)”, aimed to study the state-of-the-art of partnerships with the private sector and to generate a legal framework proposal, specific to the environmental area, as laid out in the mission and guidelines of the institution..

DEFINITION AND DESIGN OF PARTNERSHIPS INSTRUMENTS

As pointed out by Rodrigues (2009), Di Pietro (2005) and Justen Filho (2005), “partnerships” can be understood, in a broader sense, to include several approaches for reaching common goals. Regardless of the specific type chosen (concession, permission, authorization, public-private partnership, civil society partnership, etc.), the delegation modalities for rendering services are policy-making instruments (Justen Filho 2005). The author mentions constitutional fundamentals that must be followed and embedded in the partnership process and that, in the case of tourism-supporting services in national parks, they are directly associated with issues such as: right of access, transparency of rules and restrictions, diversity of recreational opportunities, and understanding the different audience profiles (purchase power, motivation, origin).

Hence, understanding the different modalities for rendering services and their respective characteristics matters in order to plan for tourism management in a given area. Thus, considering aspects such as visitor experience, economic scale of the service and/or development, total number of users, estimated gross sales with the service delivered, originality of the service type in the area, supply of the service in a regional scale are important to the success of the project (Rodrigues 2009). Aside from these market-related aspects and various tourism dynamics, partnerships must

initially consider the objectives and goals of national parks, the managing capacity of the entities in charge of protected areas and the impact of these services in social and economic terms (socially and economically).

For instance, the design of a concession contract in a national park requires the understanding and consideration of social and economic factors that go beyond the definition of the object and/or activity to be concessioned in the management plan of the protected area. One of the major elements in the elaboration of an economic feasibility study for starting a service is the market in which the service is inserted. It is important to know how visitation takes place in the municipalities around the park, for example.

So, the economic viability of the proposed service as well as the visitation-supporting activities largely depend upon factors outside of the tourism management in a protected area and are not under the responsibility of the administrating agencies of these areas. Visitation frequency in a national park is influenced by external conditions, such as: access, infrastructure for lodging and food, tourism promotion, variety of attractions etc. Such aspects do influence the demand for a touristic destination and, therefore, the demand for visitation services in protected areas. Consequently, the dynamics of tourism in a given region requires the coordination of sectoral policies, considering the respective functions of the institutions involved, but also the common objective regarding tourism sustainability.

Hence, the process of building partnerships also depends on the knowledge of the managers about the protected areas regarding the market and the dynamics of tourism in a given region. This means that, aside from the activities related to the protection of biodiversity, managers are also required, when developing a partnership, to consider aspects such as economic viability, quality of service, visitor care, etc. Even if the management of a concession contract is done by the administrative and financial offices of the institution, the local management of the contract and the direct dialogue with visitors is supervised by local park managers.

As shown in the study by Carrillo and Catapan (2015), ICMBio uses many forms of private partnerships, which may or may not include the transfer of financial resources.

National Park	Services	Type
1. Iguaçu (PR)	Stores, snack bars, restaurants, parking area, ticket office, boat tour, shuttle, visitor center, panoramic flight, canoeing, biking.	concession
2. Tijuca (RJ)	Shuttle service (bus and train), parking area, ticket office, snack bar, visitor center, store, and cafe.	
	Visitor guide	authorization
3. Noronha (PE)	Ticket office, trail maintenance and information center maintenance.	concession
	Visitor guide	authorization
	Underwater photo and video	
	Diving	
4. Serra dos Órgãos (RJ)	Ticket office, trail maintenance and information center maintenance.	concession
	Snack bar and souvenir shop	permission
	Visitor guide	authorization
5. Brasília (DF)	Snack bar	concession
6. Lençóis Maranhenses (MA)	Visitor guide, ATV ride	authorization
7. Restinga de Jurubatiba	Visitor guide, boat tour, ATV ride	
8. Abrolhos (BA)	On-board visitation, free diving and independent diving	
9. Itatiaia (RJ/MG)	Visitor Guide	
10. Serra da Canastra (MG)	Visitor Guide and transportation	
11. Ubajara (CE)	Visitor guide	
12. Chapada dos Guimarães (MT)		
13. Cavernas do Peruaçu (MG)		
14. Ilha Grande (MS, PR)	Nautical leisure activities	
15. Emas (GO)	Visitor Guide	
16. Jericoacoara	Visitor Guide and transportation, nautical sports instruction	
17. Caparaó (MG/ES)	Visitor Guide	
18. Chapada dos Veadeiros	Visitor Guide, canyoning	

Source: CGEUP/ICMBio – 2016.

Figure 1. Services that support tourism – Concessions.

Considering the size of the federal system, with currently 327 protected areas, which have different levels of protection and implementation, standardizing the types of partnership is not an easy task. Figure 1 depicts the national parks that have visitation-supporting services formalized by ICMBio through concessions, permissions and authorizations. It is important to consider this assessment was done together with CGEUP, located in ICMBio headquarters, and that updating these data requires a constant dialogue with national parks in order to reach a full partnership picture.

The different types of partnerships are used according to the characteristics of the area, the dynamics of the visitation and the service/activity offered. Thus, in general terms, a “concession” is formalized through an administrative contract between the government and private institutions, it may involve private investments and is preceded by bidding. A “permission” involves small and medium-sized ventures, it can be granted to a company or individuals and is formalized through bidding. Finally, an “authorization” is a unilateral administrative act that can be granted to companies or individuals, individually. On the one hand, areas such as Tijuca National Park (Rio de Janeiro) and Iguacu National Park (Paraná) receive millions of visitors and have concession contracts with quite impressive financial volumes, on the other most of the parks in the Brazilian federal system do not receive the same visitor flow but need and require minimum structure for visitation to take place. An interesting example of a small-scale operation is the authorization for practicing canyoning (rappelling and hiking down canyons with expert guidance) in Chapada dos Veadeiros National Park (Goiás). In April 2016, a federal ordinance was enacted, and it set forth the payment for authorization, with outfitters having to register and follow rules and standards related to the conservation of biodiversity, visitor’s experience and safety. This authorization is an interesting option in cases of smaller-scale activities in which technical requirements are established beforehand and any outfitter that meets these requirements may work in the protected area.

In addition to the partnerships presented in Figure 1, there is an undergoing implementation process of a set of concessions for the provision

of services in other national parks in the country (Brasília, Pau Brazil, Caparaó, Serra da Bocaina, etc.), which are expected to be set forth beginning in 2018.

Finally, finding the balance between the current legislation and the specificity of the needs for a protected area is a challenging exercise for managers. As pointed out by Rodrigues (2009), when delegating the provision of services, the public authority requires that the service is provided with quality, safety and the least impact to the resources involved (environmental, social, cultural). Since it is a National Park, service provision in support of visitation includes the adoption of environmental criteria in line with the area objective and the basic principles of the environmental legislation. So, environmental charges and responsibilities must be a relevant part of the concession contract. Nevertheless, inspection and monitoring of the contract-associated impacts are to be handled by the public institution and depend directly on its management capacity.

PARTNERSHIP MANAGEMENT AND MONITORING

Partnerships for visitation service provision may fulfill many functions within the realm of protected area management. There are countless visitation possibilities and forms in protected areas, depending upon the objective and function of each area. For each type of service or activity there must be a set of procedures to monitor and control undesirable impacts derived from their development, as well as the beneficial effects to the protected area and its visitors. Thus, monitoring partnerships, created for managing visitors and providing goods and services, is a fundamental tool so that the management agency may understand the dynamics of visitation and then define corrective and preventive measures that benefit the goals of protected areas. Monitoring involves two major components: 1 – checking compliance with contract provisions, responsibilities and goals. 2 – analysis of environmental, social and economic impacts related to the provision of services. As an example, we can mention protecting and providing for visitor experiences and the adoption of impact management techniques.

Concession services may lead to higher quality during visitation because of specialized services, employees and equipment. However, this does not mean the agency in charge will put less effort in managing visitation, because it will have to monitor the services provided, consider environmental (minimum impact), economic (accessible tariffs and economic-financial equilibrium of the contract) and social (visitor satisfaction, number of jobs created, etc) criteria.

One of the greatest institutional challenges of ICMBio is the lack of staff to meet the demand for management in a protected area. In 2016, ICMBio counted on a staff of approximately 2000 employees in charge of managing almost 400 administrative units among protected areas and other administrative structures. There is demand for better visitation services and the flow of visitors is increasing, but due to budget cuts faced by the government, looking for partners has been one of the alternatives implemented by the public authority to make it possible to support public use and protected area management. However, delegating services by the government requires the implementation of a management structure capable of properly monitoring partnerships. Trained staff that can deal with concession contracts is a critical element in the establishment of partnerships (Thompson et al. 2014). Thus, ICMBio enacted the Norm (IN), number 2, as of January 30th, 2017, which sets forth the planning, execution and monitoring of public use concessions for aiding visitation in protected areas. This legal instrument defines concession proposals, considering the necessary studies and research as well as the approval by the Management Committee of ICMBio. Regarding monitoring, an Enforcement Committee was created to monitor and enforce the contract in a way as to ensure the compliance of agreed conditions.

Information and analysis gathered in the monitoring process will be compiled in an annual report. The above-mentioned norm also mentions broad publicity should be given to concession processes. Hence, it is expected that the effects of the concession contracts will be made public aimed at sharing the advancements in delegating activities. The approach will be to include aspects such as the management of a National Park, improving the quality of services rendered to users, generating jobs and

income, etc., in order to ensure the transparency of the process and partnership management.

CONCLUSION

Public Private Partnerships for public use and recreation services in national parks are encouraged within the public sector as one of the alternatives to support the protection and management of these areas. In Brazil, as mentioned in this chapter, this theme still requires maturing and a broad debate on the different institutional arrangements adopted and on the ways in which people take ownership of public spaces. In this context, the public function of national parks, in their many instances, from the protection of biodiversity to the availability of spaces for outdoor leisure and education, is the guiding principle that must be respected in the process of setting up partnerships. This theme becomes even more relevant given the current economic and institutional crises experienced by the country.

In the last five years, we have observed an increase in the number of tourism-supporting services partnerships starting at ICMBio as well as an advance in the procedures adopted by the agency. However, the planning, implementation, and monitoring of partnerships all depend on a proper management structure, considering human and financial resources, a set of clear roles and responsibilities between the public and the private sectors, and the broad dissemination of the partnership outcomes to the society. Such aspects require constant assessment of the institutions involved and are the pillars needed to pursue the implementation of partnerships that can strengthen the public good and its ownership by the society in a sustainable manner.

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Chapter 4

TOURISM ATTRACTIVENESS INDEX OF PROTECTED AREAS OF BRAZIL^{*}

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ABSTRACT

Recreation opportunities are formed by four elements: visitors searching for *recreation activities*, in *particular settings* to have *experiences* that lead to *benefits*. The notion of Recreation Opportunities is the core concept of the framework Recreation Opportunity Spectrum (ROS). The purpose of this chapter is to apply ROS to develop a Tourism Attractiveness Index of protected areas (PA) in Brazil. ROS works with indicators of three different attributes: physical, social and managerial. The chapter adapted indicators for each of these attributes for the Brazilian

^{*} The present chapter is based on the PhD dissertation “Recreation Classification, Tourism Demand and Economic Impact Analyses of the Federal Protected Areas of Brazil.” (Souza, 2016)

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reality. However, visitors also consider other factors outside PAs when deciding their destination. To address this factors, a new dimension of external physical, social and managerial attributes was also developed. The federal protected area (PA) system of Brazil encompasses 76 million hectares divided into 326 units of which 71 are designated as national parks and 65 as national forests. The chapter collected data from 94 national parks and forests to present a panorama of different recreation opportunities offered in Brazil based on PA's internal and external settings. The internal indicators considered were natural and cultural variety, scenic attractiveness, activities, density, facilities, services, staff, budget, internal access, land tenure and regulations. The external variables considered were regional attractions, access, hospitality establishments, socioeconomic context, and population density. The results present a general classification of recreational opportunities for Brazilian PAs. The classification can assist decision makers and managers to define visitors' profiles, allocate resources, prioritize investment, and ensure conservation and sustainability for the system.

Keywords: ecotourism, outdoor recreation, public use, sustainable tourism, protected areas, National Park, National Forest

INTRODUCTION

Brazil is a continental nation containing various ecosystems and mega biodiversity. The natural beauty is so inherent that the country is considered the most competitive tourism destination in the world in the category of natural resources (Crotti and Misrashi 2015). Even though the most beautiful natural landscapes are located inside protected areas (PA), the country receives a comparatively small volume of tourists. In 2015, PAs of Brazil received 8 million national and international visitors in a total area of 79 million hectares (ICMBio 2016). This territory is more than double the area managed by the North American National Parks System, which received around 300 million visitors at the same year (Cullinane and Koontz 2016). To maintain visitation growth, Brazil needs to better understand the dynamics of the tourism industry within the context of PAs. For example, why do some PAs receive high volumes of visitors while others remain unknown? Do the settings and activities offered by each area, influence

visitors choices? How the destination where the PA is located also influence visitors demand?

The IUCN states that: “All protected areas should also aim, where appropriate, to deliver recreational benefits consistent with the other objectives of management” (Dudley 2008, 11). To provide these benefits, PAs use the concept of classes of recreational opportunities or zones originated from a framework called Recreation Opportunity Spectrum (ROS) (Brown, Driver and McConnell 1978; Clark and Stankey 1979; Driver and Brown 1978). Over the years, ROS concepts were incorporated into most important visitors management systems (Stankey et al. 1985; Graefe, Kuss and Vaske 1990; Brown et al. 2009). ROS states that recreation opportunities are derived from activities in different settings. These settings have three different attributes: physical, social, and managerial (Manning 2011, 11-22). From the attributes combinations, visitors have different experiences, which turn into benefits for individuals, communities, environments, and economies. Understanding the relationships between the various settings with different activities is strategic for an adequate analysis of recreation opportunities (Aukerman and Associates 2011). Based on a recreation plan, the territory of a PA is divided into different classes or zones to offer these different possibilities. The same principle can be used at system level, where different PAs are managed to offer specific recreation opportunities (Brown et al. 2009).

The initial ROS model only considers physical, social and managerial attributes within the PAs without taking into account the external setting of the tourist destinations. However, a site is considered by visitors within the larger context of a destination and is evaluated based on its tourism attractiveness (Formica and Uysal 2006). The concept has been widely used to classify destinations, and has also been applied within the context of protected areas (Choi 2012; Deng et al. 2002; Lee et al. 2010). Studies have found that the number of visitors is correlated to external settings of the PAs (Souza 2016; Nervonen et al. 2010; Puustinen et al. 2009) as well as internal settings (Hanink and White 1999; Hanink and Stutts 2002; Loomis 2004). The decision to travel is determined by attributes located inside a PA (i.e., type of landscape, facilities, and services) but also for attributes located

outside (i.e., distance, access, regional infrastructure) (Viveiros de Castro, Souza and Thapa 2015). Determining the relative importance of each of these attributes is considered the most critical aspect to develop a tourist destination (Hu and Ritchie 1993).

Analyzing attractions and supporting attributes, Lee, Huang and Yeh (2010) highlight that the primary objective of visitors is always to appreciate the natural and cultural attractions. However, Puustinen et al., (2009) noted that PAs that provide better recreation services related to activities attract more visitors. Hanink and Stutts (2002) found that site location is an essential factor related to the volume of visitation. PAs with greater demand potentials are situated closer to larger population centers. Population distance is critical because the travel cost to the PA determines the lower and upper limits of potential demand. Deng, King and Bauer (2002) also identified that besides natural resources, accessibility is a critical dimension of a destination. Moreover, Lee, Huang and Yeh (2010) include the provision of catering and accommodation as decisive attributes that work together with external access.

Therefore, a new external setting of physical, social and managerial attributes was further developed to expand the analysis of recreation opportunities within the perspective of a tourist destination (Souza 2016; Viveiros de Castro, Souza and Thapa 2015). The external setting was first proposed by Viveiros de Castro, Souza and Thapa (2015) with national parks of Brazil, where was demonstrated that tourism demand in the areas were internally correlated to reputation and recreation facilities; but also externally linked to attractions in the region and population density.

The present paper uses the ROS physical, social and managerial attributes to inventory and determine main classes of recreational use at the system level for federal PAs of Brazil. The purpose is to develop a tourism attractive index including internal and external settings. The objective is to establish metrics to plan and monitor progress in outdoor recreation opportunities for the entire system. ROS was developed by managers for managers, and due to its simplicity, pragmatic, and replicable approach (McCool, Clark and Stankey 2007), is especially adequate for Brazilian PA system that suffers from a historic deficit of personnel and budget.

METHODS

Sample

From the 8 million visitors in 2015, national parks and forests received 93% of total. The research collected data from 58 national parks (NP) and 36 national forests (NF) managed by the federal agency Chico Mendes Institute for Biodiversity Conservation (ICMBio). From the 94 PAs of the sample, 62 reported visitation in 2015 (Souza 2016). PAs managers answered questionnaires sent via the survey software Qualtrics. Data collection was supplemented with secondary sources from ICMBio's internal documents (i.e., management reports), other government databases and internet (Google Search and TripAdvisor). Data collection were structured to be a cost-effective tool for monitoring visitor use. The use of social media as a source of information within the tourism academic discipline has been found to be a reliable alternative as it is more practical and less costly than primary field data (Wood et al. 2013). The variables, described below, were based on previous research from Viveiros de Castro and others (2015).

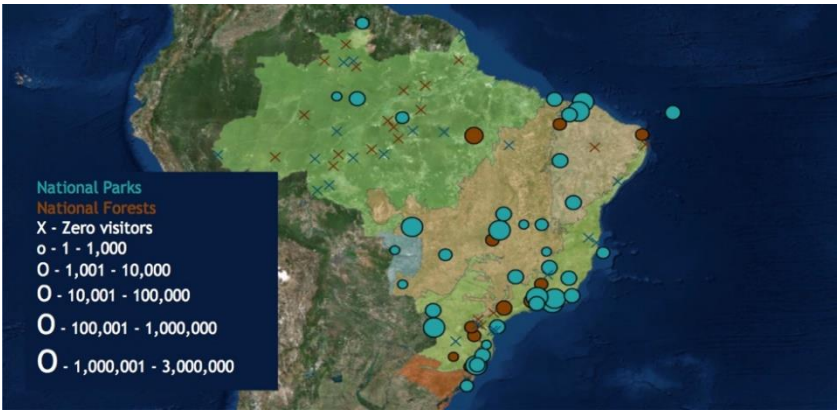


Figure 1. Visitation demand in the 62 national parks and forests of Brazil included in the sample.

Data and Variables

A resource classification system based on the ROS attributes (physical, social and managerial) was developed to group the protected areas by primary vocation. Internal and external attributes were designed to address the PAs within a tourist destination as in Viveiros de Castro, Souza and Thapa (2015). The indicators in each attribute were indexed in a 5-point scale, summed and divided by the number of variables to classify each site.

The internal physical attributes (Table 1) are comprised of natural/cultural variety (number of different landscapes, waterscapes, and cultural expressions) and scenic attractiveness. The internal social attributes encompass a variable that represents the diversity of recreation and sports activities (e.g., trekking, climbing, diving, cycling, etc.) and crowding. The internal managerial attributes include variables that focus on recreation facilities (e.g., lookouts, parking lots, visitor center), visitor services (e.g., guides, concessionaires), staff number, budget in 2015 and internal access (kilometers of trails, unpaved and paved roads), planning tools (e.g., management documents, outdoor recreation plan) and land tenure (percentage of government's ownership).

The variables within the external setting (Table 1) consider regional characteristics that can influence visitation. The physical attributes consist of attractions in the region based on the location of the PAs. Meanwhile, the social attributes evaluate public in potential. To estimate day use area, a buffer zone of 100 km around the PAs was used; on the other hand, the socio-economic context was verified through average human development index (HDI) of the gateway community. Information about the regions and population were collected from georeferenced databases of ICMBio, Brazilian Institute of Environment and Natural Resources, Ministry of Transport, and Brazilian Institute of Geography and Statistics. Additionally, access conditions were evaluated through time distance from the closest commercial airport. Data were processed in SPSS, ARCGIS and Numbers Spreadsheet (Kil and Confer 2005). For the managerial category, information was compiled from the TripAdvisor website for the respective locations, counting accommodations and restaurants in “Things to do”.

Table 1. Operationalization of Variables

Attributes	Description	Data source
<i>Internal Setting</i>		
Physical Attributes		
Natural/Cultural Variety	Number of different landscapes within the PA (mountain, beach, falls, etc.)	PA managers
Scenic Attractiveness	Number and origin of citations of the PA's name and most important attraction (log)	Google search engine
Social Attributes		
Diversity of Activities	Number of recreation and sports activities offered (trekking, climbing, cycling, etc.)	PA managers
Visitors Density	PA area (km ²) / (number of visitors/year) (log)	ICMBio database
Managerial Attributes		
Recreation Facilities	Number of structures offered (lookouts, parking lots, visitor center, etc.)	PA managers
Visitor Services	Number of services provided by the PA or concessionaires (transport, food, etc.)	
PA Staff	Number of PA staff	
PA Budget	One year budget spent per PA	
Planning Tools	Number of management documents that the PA already produced and updated (General Management Plan, Outdoor Recreation Plan, Interpretation Plan, etc.)	

Internal Access	Kilometers of internal roads and trails	PA managers
Land Tenure	Percentage of the PA owned by the government	
<i>External setting</i>		
Physical Attributes		
Regional Attractions	Number of tourist attractions in the region where the PA is inserted measured through the number of "Things to Do" of the gateway communities (log)	TripAdvisor website
Public Access	Travel time from nearest commercial airport (log)	Google maps
Social Attributes		
Socioeconomic context	Average Human Development Index - HDI of the municipalities included in the 100km buffer zone	Brazilian Institute of Geography and Statistics and Ministry of Transport
Population Density	Number of citizens living in municipalities included in a buffer zone of 100 km around the PA (log)	
Managerial Attributes		
Hospitality Establishments	Number of lodging and restaurants mentioned for the gateway communities (log)	TripAdvisor website

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Data Analysis*

The indicators in each attribute were indexed in a 5-point scale. The Natural Breaks optimization method was used to divide the PAs into the 5 groups (Jenks 1967). For logarithm transformed variables, classes were divided based on standard deviation of the mean. For each indicator, PAs received a score for between 1 and 5. For each internal and external attribute, PAs were classified summing all indicators scores and dividing by the number of indicators (e.g., physical attribute score = natural variety score + scenic attractiveness score / 2). The three internal scores (physical, social and managerial) summed and divided by three, composed the overall internal score and the same three external scores summed and divided by three, composed the overall external score. The internal and external scores summed and divided by two, formed the final score. The PAs' scores defined their internal, external and final classification (1 - primitive, 2 - semiprimitive, 3 - extensive, 4 - intensive and 5 - highly intensive).

To facilitate the understanding among Brazilian managers, the names of the classes of recreation were based on the zoning system for national parks in Brazil (IBAMA 2002).

Based on the indicators, a general internal and external profile of each class is presented in Figure 6. General descriptions provide a picture of the class of recreational use. They offer an easy way to identify the attributes expected in each class. The descriptions and indicators also support periodic evaluation of the development of recreation opportunities within the areas (Brown, Driver and McConnell 1978; Driver and Brown 1978; Brown et al. 2009; Aukerman and Associates 2011; Cocklin, Harte and Hay 1990; More et al. 2003).

* To test the practicability of the classes systematization, a statistic test, one-way ANOVA, was conducted comparing number of visits between the different classes. Check chapter 2 of the PhD dissertation that originated this text for more information (Souza 2016).

RESULTS

Internal Setting Classification

Considering the internal physical attributes, PA managers identified 25 categories of natural attractions and 11 man-made attractions. Few PAs reported just one and Serra da Bocaina NP informed the largest number (16). On average, PAs reported six categories of attractions. The five most common attractions were: Forest (73%), Rivers (67%), Waterfalls (48%), Geological Formations (42%), and Cultural Heritage (39%). The scenic attractiveness variable demonstrated that some Brazilian PAs are only cited within their own state while others are known internationally. Overall, no PA was classified as primitive, 31 as semi primitive, 32 as extensive, 21 as intensive and ten as highly intensive.

Regarding internal social attributes, managers identified 58 different activities (e.g., hiking or swimming) that are currently happening in PAs of Brazil. Lençóis Maranhenses NP with 26 and Jericoacoara NP with 25 were the areas who informed the greatest number of activities. On average, PAs that receive visitors reported having ten different activities. The 5 most common activities were: 1 - Walk up to half day (up to 5 miles round trip), 2 - Contemplation, 3 - Photographing / Filming, 4 - Educational / school visit, 5 - Observation of fauna and flora in general. The average of internal social attributes grouped 25 PAs in primitive use category, 33 in semiprimitive, 24 in extensive, 10 in intensive and only 2 in highly intensive.

The internal managerial attributes include many aspects of PAs management. While 13 PAs reported having no facilities, on the other hand, Tijuca NP (18), Serra da Capivara NP (17), and Itatiaia NP (17) were the ones with the greatest number of structures. On average, the PAs who reported having facilities had six different infrastructures. Regarding service, the analysis found that 30% of PAs offer some kind of commercial services to the public. Guidance is the most common, followed by internal transportation, eating, and lodging. The results included 9 PAs as primitive, 36 as semiprimitive, 39 as extensive, seven as intensive and two as highly intensive.

Summing the three internal attributes, the overall classification was: 6 PAs were considered primitive, 40 semi primitive, 38 extensive, nine intensive and one highly intensive (Figure 2). For a detailed description of the settings parameters, see Souza (2016).

External Setting Classification

External physical attributes evaluate the natural/cultural attractions and physical access to the destination. Iguaçu NP, for example, was classified in a highly intensive destination. It is located within a city with an extraordinary number of other attractions and easy airport access, on the other hand, primitive class PAs are located in very remote areas where the park or forest is the only attraction and access is very difficult. The results show 15 PAs as primitive, 29 as semi-primitive, 27 as extensive, 17 as intensive and only six as highly intensive.

External social attributes measured the size and quality of potential day use visitors. The highly intensive PAs, as Serra dos Órgãos and Ipanema NF, are located in dense and well-developed regions; on the other side, the semi-primitive PAs, as Monte Roraima NP and Capivara NP, are located in undeveloped regions with low HDI and small population around. Considering the average of both attributes only one was considered as primitive, 18 as semi-primitive, 39 as extensive, 28 as intensive and eight as highly intensive use.

External managerial attributes look at how prepared the gateway communities are to receive tourists. The city of Rio de Janeiro (RJ) and the city of Brasília (DF) have the greater number of establishments of accommodations and meals, therefore Tijuca NP, Brasília NP, and Brasília NF were classified as the highly intensive class. On the other hand, the primitive class PAs such as Tapajós NF in the city of Belterra (PAs) and Sete Cidades NP in the city of Brasileira (PI), are located in municipalities with very limited structure to support tourist demand. The external managerial attributes grouped 20 PAs in primitive category, 25 in semi-

primitive, 28 in extensive, 18 in intensive and only 3 in highly intensive (Figure 2).

Summing the three external attributes, the overall classification was: 6 PAs were considered primitive, 33 semiprimitive, 34 extensive, 18 intensive and three highly intensive (Figure 2). For a detailed description of the settings parameters, see Souza (2016).

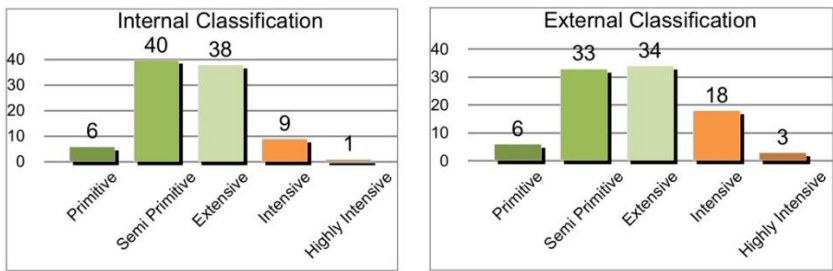


Figure 2. Overall Internal and External Inventories Compared.

Figure 2 compares the overall internal and external settings for all PAs. In both settings, semi primitive and extensive are the predominant classes in the system. Comparing the overall internal and external settings, the external one has more than double the number of intensive and highly intensive PAs than the internal setting. However, even if the class distribution offers some similarity, when you compare settings, half of the PAs present different internal and external classification.

Overall Final Classification

Final classification presents semi primitive (42%) and extensive (45%) as major categories similar with internal and external classes. The final classification has the lower number of highly intensive and intensive areas than the internal and external inventories. The reason is the unbalance between the overall internal and external classification causing the areas to have a final lower class of use. Considering the average of internal and

external settings, final classification presents five primitive PAs, 39 semi-primitive, 42 extensive, seven intensive and only one highly intensive.

Figure 3 shows the final geographical inventory of recreation classes of use. Five of the eight more developed area are located in Southeast of Brazil, the region that concentrates the biggest cities and most of Brazilian population. On the other hand, the Amazon region (33 PAs) has only 4 PA classified as extensive category and none intensive or highly intensive.

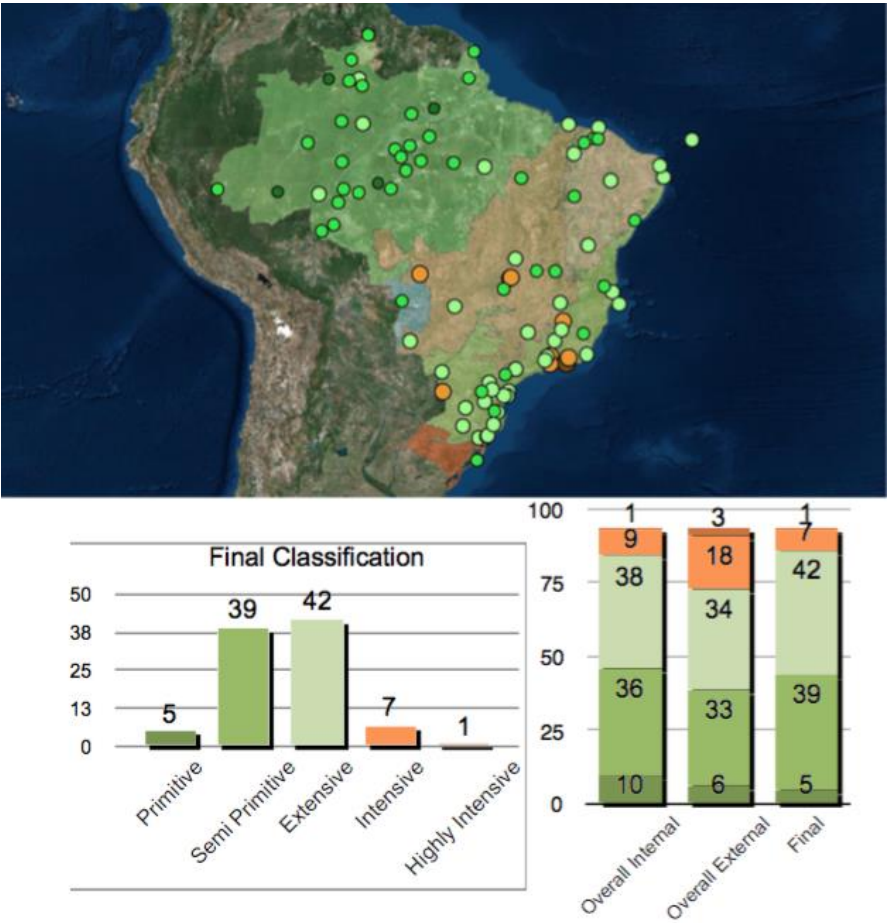


Figure 3. Overall Visitation Classifications of use for Brazilian PAs.

Figure 4 shows how much area and visitors is contained in each recreation class of the Final Overall Classification. The column Area-Mean demonstrates that the average size of PAs in the sample diminishes from primitive to highly intensive. The contrary happens with number of visitors (Visits-Mean) and visitors per hectare that increase from semi primitive to highly intensive. They also show that 39% of all visitation occurs in the highly intensive PAs or 0.01% of the total area. If we sum highly intensive and intensive, 73% of all visitors use 2% of the systems area.

Classes	PAs	Area Mean (ha)	Area Total (ha)	% Area Total	Visits Mean	Visits Sum	% Visits Total
Primitive	5	761,530	3,807,652	15%	0	0	0%
Semi Primitive	39	441,545	17,220,284	67%	5,361	209,091	3%
Extensive	42	99,869	4,194,511	16%	42,108	1,768,532	24%
Intensive	7	58,001	406,013	2%	365,685	2,559,797	34%
Highly Intensive	1	3,958	3,958	0.01 %	2,945,355	2,945,355	39%

Figure 4. Variation of Area and Visitors per Final Classification

Description of the Tourism Attractiveness Index

General internal and external descriptions of each class were developed to facilitate the identification of existing and new PAs (Figure 6). The description of each class was also validated by the author's experience with a large set of the PAs. The table is useful to communicate the concepts developed in this chapter and to facilitate classification and planning of protected areas. To facilitate knowledge dissemination, a visual table was also developed (Figure 5).



Figure 5. Recreation opportunity classes of use in national parks and forest of Brazil. Souza (2016)

	Internal	External
Primitive Use	PAs are normally very large and remote with a high degree of naturalness and integrity of ecological processes. When local communities are present, they maintain traditional methods of livelihoods. There is no evidence of tourism and encounters with other visitors are rare. No infrastructure is offered, and users should follow "leave no trace" techniques.	The region is not a tourist destination and offers almost no infrastructure. Access normally is difficult and requires a flight and an off-road drive or boat ride for more than four hours. Visitors are limited to locals or expeditions of high skilled and educated researchers or ecotourists that require no assistance.
Semi Primitive Use	PAs are large and remote with high degree of integrity of natural processes and may have resources management by local communities, which can compose attractions for visitors. There is little evidence of tourism, and encounters with other visitors are seldom. Opportunity for solitude, autonomy, navigation, and challenge. Internal access is usually by foot or rustic unpaved roads. Besides rustic signed trails and undeveloped campsites, there is almost no infrastructure or services available. Visitation requires appropriate equipment, field skills or a guide and should follow "leave no trace" techniques.	The region is a small destination or nearby a small city. Offers very basic tourist infrastructure such as few lodging and restaurants options, small grocery stores, and few gas stations. Access normally is difficult and requires a flight and drive for more than two hours generally on unpaved roads. Visitors are ecotourists that plan ahead and come specifically for the PAs.

Figure 6. (Continued)

	Internal	External
Extensive Use	<p>Presence of human activity is more evident including sustainable use of resources (in NF). Landscape may contain a mixture of natural and cultural features offering attractions at regional level. PAs offer more well-marked trails or better managed unpaved roads. Although there are opportunities for privacy, meetings and interaction with other users, staff, locals and traditional communities are more frequent. Management capacity focuses on conservation but also recreation opportunities. Basic infrastructure is offered at designated sites, like rustic visitor centers, campgrounds, restrooms, etc.</p>	<p>Regional tourist destination or nearby a medium city. Offers some tourist infrastructure such as lodging, restaurants and snack bars, grocery stores, and gas stations. Sometimes there are tourism agencies or regional hospital. Access normally requires a flight and drive between one to two hours on paved or unpaved roads. If the PAs is a premium attraction, visitors come for a few days; otherwise, they are in the area for other interests or are local day users.</p>
Intensive Use	<p>Landscape contains a mixture of natural and cultural features offering excellent variety and attractiveness at national level, or even for international demand. Internal access via well managed unpaved roads but mostly on paved ones and well-designated trails. Developed visitor centers, exhibits, interpretative trails. Recreation is one important mission of the PAs, and more attention is given to the quality of the experience, safety of visitors and management of sensitive areas. There is a good variety of activities and services offered. Increases the possibility for more meetings and interaction.</p>	<p>National destination or nearby a large city. Destination is usually in the most developed and high-density areas of the country and offer very good tourist infrastructure such as: lodging from one to five stars, great variety of restaurants, grocery stores, gas stations, tourism agencies, hospitals, etc. Agencies sell tourism packages nationally for the destination. Access is easy and fast through airports and duplicated roads. Tourists come from all over the country, from different ages and profiles. PA can be the primary or secondary attraction in their travel, and local day users are common too.</p>

Figure 6. (Continued)

	Internal	External
Highly Intensive Use	PAs that are Brazilian icons known worldwide. Landscape contains a mixture of natural and cultural features offering excellent variety and attractiveness for national and international visitors. Internal access happens on paved roads and well designated trails. Infrastructure is designed and suitable for heavy intensive use and provides developed visitors centers, exhibits, and interpretative trails. Visitation is one management priority with more attention to the quality of the experience, safety of visitors and management of sensitive areas. A good variety of activities and services are offered. Meetings and interaction happen all the time and visitor may experience some crowd situations.	Region is a consolidated international destination, usually located in the most developed and high-density areas of the country. The destination offers complete tourist infrastructure such as lodging from one to five stars, great variety of restaurants, grocery stores, gas stations, tourism agencies, hospitals. Agencies sell tourism packages internationally. Access is easy and fast through international airports and duplicated roads. Tourists come from everywhere, from all ages and every profile, and local day users are common too. The PA is one of the main attractions, but the destination has a wide range of options.

Figure 6. Description of the Tourism Attractiveness Index

DISCUSSION

The research developed a Tourism Attractiveness Index for the federal PAs of Brazil. The methodology provides a picture of the actual status of the PA system while managing 8 million visitors and provide indications of how to offer a wider spectrum of recreation opportunities. It is important to note that just the increase of visitors’ numbers is not the objective, it is also important to provide quality experiences and promote conservation. Taking this in consideration, this extended ROS approach offers a useful framework to strategically decide what attributes need more investments or which PAs have more demand potential.

Highlighting a few situations that the tool identify, internal attributes are a case to be analysed. Regards to the physical attributes, PAs are skewed

towards more demanding classes with 31 classified as intensive and highly intensive use, however, the same thing does not occur on the social and managerial attributes where PAs are more concentrated in less demanding classes. PAs as Chapada Diamantina and Emas NPs have outstanding physical attributes but do not offer enough activities, facilities or services to achieve their full spectrum of recreation opportunities. In general, few PAs have social and managerial conditions to fulfil their potential for tourism. The pattern is different for the external attributes where there is a greater balance between physical, social and management attributes. Tourist destinations enterprises are not strictly regulated by the government as PAs, which depends of the agency capacity to develop facilities and services. The private sector is more independent to develop business and other attractions in the region.

Comparing the overall internal and external scores, the external one has more than double the number of intensive and highly intensive PAs than the internal setting. ICMBio should give special attention for PAs where the internal or external classification differs from the final class. Some of those PAs are still undeveloped but are located in strategic tourism destinations. Brasília NF and Itajaí NP represent cases where internally the PAs lack from activities, facilities, and services but externally, the areas are located in consolidated tourist destinations such as the cities of Brasília (DF) and Blumenau (SC), respectively. These PAs basically need internal investments from ICMBio to increase visitation. Internally undeveloped sites located closer to high-density areas should receive more investments due to their high potential to increase visitation influx (Clawson and Knetsch 1963). It is an opportunity to promote outdoor recreation and conservation awareness with a relatively low effort, taking advantage of an already structured destination.

On the other hand, Serra da Capivara and Monte Roraima NP are examples of PAs that are better scored internally than externally. Monte Roraima is an outstanding and well-known natural landscape but totally isolated. This NP has a high degree of difficulty, requiring several days of heavy trekking to reach the summit and its use is targeted to very specific visitor segment. The development of the park and the region should be

planned carefully not to compromise the visitor's experience and may not represent great benefit if the development of the region and access are not considered. Serra da Capivara, in turn, is also a remote destination with the worst Human Development Index (HDI) of the country but is a very important archeological site with excellent internal infrastructure. This NP is an outstanding destination *per se* and can be a vector of development for a whole region with an effective plan of marketing and easy and faster access possibilities. However, these areas should be carefully planned considering external variables such as access, infrastructure and other attractions in the region, otherwise, internal investments will be wasted due to low visitor demand. These situations need more complex political arrangements to develop the entire region and support the tourism growth.

Regards to the description of the Tourism Attractiveness Index in Brazil, it seems to be in conformity with other ROS classifications around the world, as well as the original ROS. Primitive areas have small demand and need few infrastructure while highly intensive PAs have big visitor influx and request more facilities and services (Brown, Driver and McConnell 1978; Driver and Brown 1978; Brown et al. 2009; Aukerman and Associates 2011; Cocklin, Harte and Hay 1990; More et al. 2003). The external attributes demonstrated to be statistically and practically relevant, which supported previous research (Neuvonen et al. 2010; Puustinen et al. 2009; Viveiros de Castro, Souza and Thapa 2015). The classification of the whole PA system also demonstrated to be significant, reinforcing preceding studies and recommendations (Brown et al. 2009; McCool, Clark and Stankey 2007; Kil and Confer 2005).

The Tourism Attractiveness Index facilitates ICMBio to manage strategically since PAs from the same groups can be similarly administered. For example, PAs in primitive and semi-primitive classes need simple intervention (e.g., trails, campsites, basic signage) that can be easily implemented by the ICMBio staff or voluntaries. On the other hand, intensive and highly intensive PAs require architecture projects and more investments to provide necessary facilities (e.g., large parking lots, buildings) for large numbers of visitors. The system of recreational classes facilitates ICMBio management since PAs from the same groups can be

similarly administered. PAs in different classes should have access to different management strategies, different funds sources and amounts, and options for concessions contracts, for example.

Another benefit of the framework is that almost all indicators are sensible to variation, so PAs can move between classes and receive the most appropriate approach. For example, if a tourist destination build an airport, then the PA may receive a better score in external physical attributes and an upgrade to a more demanding class. With the new situation, due to the increase in visitors' demand, the PA may access new fund options to improve its facilities and provide more services. Also, new or not evaluated PAs have, with the classification system, an opportunity to understand their real potential when developing GMPs and Visitor Management Plans.

The ROS classes used in this chapter can also be matched with the actual zoning system used in GMPs. These groups can easily correspond to primitive, extensive, and intensive zones used for national parks' GMPs; for national forests, the same relationship can be done with the zones primitive, forest management, and visitation (IBAMA 2002; ICMBio 2009). One classification system with equal nomenclature for overall vocation of the PAs and internal classes of use or zone may facilitate the understanding and management of the areas.

The chapter demonstrated that, despite the rare use of the ROS classes on the system level, it can be very effective and should be used for strategic planning since it can support a vision of the entire system of PAs. The development and use of the external setting is an upgrade on the ROS methodology since the merging of recreation classification indicators and tourism demand variables expand the understanding of the settings characteristics necessary to offer a diverse spectrum of recreation opportunities, optimizing the experiences and benefits (Aukerman and Associates 2011; Puustinen et al. 2009; Viveiros de Castro, Souza and Thapa 2015). Planning should consider the plurality of potential publics, attending a full spectrum of expectations and not just focusing on the "average visitor" (Warzecha et al. 2001).

The current chapter focused on national forests and national parks, which limits the extrapolations of results for other PA categories. It should

also be noted that the survey was filled out remotely and managers' opinions may affect evaluations even though the questionnaire was developed to be as objective as possible with only quantitative questions focused on inventorying internal and external attributes. One alternative is to promote meetings where managers fill out the questionnaires together to adjust perspectives. Even considering the existence of errors in the PAs scores, the classification system demonstrated statistically significant differences between the classes, an indication that the model is reliable for visitor use management in PAs. Further research can look more specifically at the recreation opportunity classes within each ecoregion or different PA's categories. Evaluation of better management strategies for each group should also be addressed. The results also offer data to further analyze the tourism demand in PAs with the same variables used to inventory supply of recreation opportunities.

CONCLUSION

The Recreation Opportunity Spectrum (ROS) framework demonstrated to be suitable to classify outdoor recreation in the PA system of Brazil. The evaluation of the internal physical, social and managerial attributes proved to be effective and offered a panorama of visitation in the national parks and forests. Using the measurements and scores proposed, managers can understand how the settings and attributes influence visitors' activities, experiences, and benefits. The ROS settings demonstrated to be a framework that can be applied in different contexts: a cluster of PAs, an ecoregion, state level or other countries. On top of that, the use of the same attributes (physical, social and managerial) provide conditions to compare different realities (e.g., different countries), even if the indicators and measurements for each attribute are specific for each one.

The external attributes addressed the new challenges that agencies face in protected area management nowadays. The external dimension focuses on aspects such as day use population, access, and regional infrastructure which are critical to financial affairs, pricing, tourism business and

economic impacts analysis, affecting multiple stakeholders and local communities. Managers can analyze the PAs within the context of a destination and understand visitors demand to a particular area. They can also perceive the external circumstances (e.g., lack of airport nearby), beyond management capacities that are affecting number of visitors and define strategies to influence them.

Overall, the Tourism Attractiveness Index offers a scientific approach to define different management procedures and investments for each class. PAs from classes of low visitation such as Primitive and Semi Primitive require less investment than PAs in Intensive and High Intensive use classes. Different classes may have distinct management policies, programs, or investment sources to support specific demands. The present analysis proposes metrics of performance for recreation opportunities in PAs to support decision makers on allocation of resources, prioritize investments, and ensure a sustainable growth of visitation influx. A well-managed visitor use program can support conservation and create sustainability though positive social and economic impacts in PAs' region.

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APPENDIX I – TOURISM ATTRACTIVENESS INDEX OF BRAZILIAN PROTECTED AREAS

Protected	Internal				External				Final	Visitors 2015
Area	P	S	M	O	P	S	M	O	Class	
PN DA TIJUCA	4.5	5.0	4.6	4.7	5.0	5.0	5.0	5.0	4.9	2,945,355
PN DE BRASÍLIA	3.0	3.5	4.5	3.7	5.0	4.5	5.0	4.8	4.3	294,682
PN DO IGUAÇU	4.5	3.0	4.7	4.1	4.5	3.5	4.0	4.0	4.0	1,642,093
PN DA SERRA DOS ORGÃOS	4.0	3.5	3.8	3.8	3.5	4.5	4.0	4.0	3.9	217,372
PN ITATIAIA	4.0	3.5	4.3	3.9	3.5	4.0	4.0	3.8	3.9	133,801
PN DA CHAPADA DOS GUIMARÃES	4.5	4.0	3.3	3.9	4.0	3.0	4.0	3.7	3.8	174,855
FN DE BRASÍLIA	2.5	2.0	2.9	2.5	5.0	4.5	5.0	4.8	3.6	26,872
PN DA SERRA DA BOCAINA	4.5	3.5	2.8	3.6	3.0	4.0	4.0	3.7	3.6	70,122
PN DA SERRA DO CIPÓ	4.5	3.0	3.4	3.6	3.0	4.0	3.0	3.3	3.5	53,660
PN DA SERRA DO ITAJAÍ	3.5	2.5	2.3	2.8	4.0	4.5	4.0	4.2	3.5	632
PN FERNANDO DE NORONHA	3.0	4.0	4.1	3.7	3.5	3.0	3.0	3.2	3.4	85,386
PN DE JERICOACOARA	4.5	4.5	2.9	4.0	3.0	2.5	3.0	2.8	3.4	780,000

Appendix I. (Continued)

Protected	Internal				External				Final	Visitors 2015
Area	P	S	M	O	P	S	M	O	Class	
PN DO SUPERAGUI	4.5	3.5	2.2	3.4	2.5	3.5	4.0	3.3	3.4	12,711
FN DE IPANEMA	3.0	3.5	3.5	3.3	2.5	4.5	3.0	3.3	3.3	53,281
FN DE CARAJÁS	3.5	3.0	3.9	3.5	3.5	3.0	3.0	3.2	3.3	194,450
PN DA RESTINGA DE JURUBATIBA	3.5	2.0	2.4	2.6	4.5	3.5	4.0	4.0	3.3	20,000
PN DE SAINT-HILAIRE/LANGE	3.5	3.0	1.8	2.8	3.5	4.0	4.0	3.8	3.3	-
PN DOS CAMPOS GERAIS	4.0	2.5	1.6	2.7	3.0	4.5	4.0	3.8	3.3	-
PN DA SERRA DA GANDARELA	3.5	3.0	1.2	2.6	3.5	4.0	4.0	3.8	3.2	-
PN DA CHAPADA DIAMANTINA	5.0	2.5	2.6	3.4	3.5	2.5	3.0	3.0	3.2	21,435
FN DE PALMARES	2.0	3.5	2.5	2.7	4.0	3.0	4.0	3.7	3.2	2,200
FN DE SÃO FRANCISCO DE PAULA	2.5	3.0	3.3	2.9	3.0	4.0	3.0	3.3	3.1	3,832
FN DE CANELA	2.5	2.5	2.7	2.6	3.5	4.5	3.0	3.7	3.1	692
PN DE APARADOS DA SERRA	3.0	3.0	3.1	3.0	2.5	3.5	3.0	3.0	3.0	106,899
PN DE ANAVILHANAS	2.5	2.0	3.0	2.5	3.5	3.0	4.0	3.5	3.0	10,684
PN DE SÃO JOAQUIM	4.5	1.5	2.8	2.9	2.5	3.5	3.0	3.0	3.0	94,412
FN DO ARARIPE-APODI	2.0	2.5	3.2	2.6	3.5	3.5	3.0	3.3	3.0	-
FN DE LORENA	2.0	3.0	2.9	2.6	2.5	4.0	3.0	3.2	2.9	13,719
FN DA RESTINGA DE CABEDELLO	1.5	1.0	2.3	1.6	4.5	4.0	4.0	4.2	2.9	-
PN DA CHAPADA DOS VEADEIROS	3.5	2.5	3.3	3.1	2.5	2.5	3.0	2.7	2.9	56,629
PN DOS LENÇÓIS MARANHENSES	4.0	3.0	1.9	3.0	2.5	2.5	3.0	2.7	2.8	40,000
PN MARINHO DOS ABROLHOS	3.0	2.0	3.4	2.8	3.0	2.5	3.0	2.8	2.8	5,114
FN DE RITÁPOLIS	2.0	3.0	2.8	2.6	2.5	3.5	3.0	3.0	2.8	3,459
PN DAS EMAS	4.0	2.0	3.1	3.0	1.5	3.0	3.0	2.5	2.8	1,681
PN DO MONTE PASCOAL	2.5	1.5	2.6	2.2	3.5	2.5	4.0	3.3	2.8	-

PN DAS ARAUCÁRIAS	3.0	1.0	1.7	1.9	3.0	3.5	4.0	3.5	2.7	-
FN DE PASSA QUATRO	1.5	3.5	3.2	2.7	2.5	3.5	2.0	2.7	2.7	30,461
PN MAPINGUARI	2.0	1.5	2.2	1.9	3.5	3.0	4.0	3.5	2.7	-
PN DAS SEMPRE-VIVAS	3.5	2.0	2.1	2.5	2.5	3.0	3.0	2.8	2.7	26
PN DA SERRA DA CANASTRA	4.0	1.5	2.6	2.7	1.5	3.5	3.0	2.7	2.7	52,673
FN DE TRÊS BARRAS	2.5	2.5	2.8	2.6	2.0	3.0	3.0	2.7	2.6	3,187
PN DAS ILHAS DOS CURRAIS	1.5	1.5	1.7	1.6	3.0	4.0	4.0	3.7	2.6	-
PN DA SERRA DA BODOQUENA	3.5	2.0	1.6	2.4	3.0	2.5	3.0	2.8	2.6	389
PN DA SERRA GERAL	3.0	2.5	2.1	2.5	2.5	3.5	2.0	2.7	2.6	82,440
FN DO ASSUNGUI	1.5	1.0	2.6	1.7	3.5	4.0	3.0	3.5	2.6	-
PN DO VIRUÁ	3.5	2.5	3.3	3.1	2.5	2.5	1.0	2.0	2.5	-
FN DE PIRAÍ DO SUL	2.0	1.5	2.8	2.1	2.5	3.5	3.0	3.0	2.5	-
PN DA ILHA GRANDE	3.0	2.0	2.2	2.4	2.0	3.0	3.0	2.7	2.5	36,850
FN DE NÍSIA FLORESTA	1.5	2.5	2.7	2.2	3.5	3.0	2.0	2.8	2.5	1,440
FN DE PASSO FUNDO	2.0	1.5	2.6	2.0	3.0	4.0	2.0	3.0	2.5	190
PN DO CAPARAÓ	4.0	2.0	3.3	3.1	1.0	3.5	1.0	1.8	2.5	54,548
PN DO JAÚ	3.5	2.0	2.9	2.8	2.0	2.0	2.0	2.0	2.4	920
PN DE UBAJARA	3.0	2.5	2.4	2.6	1.5	3.0	2.0	2.2	2.4	104924
PN DE SETE CIDADES	3.5	2.5	3.8	3.3	1.5	2.0	1.0	1.5	2.4	17,303
PN DA SERRA DA CAPIVARA	3.0	2.5	4.1	3.2	1.0	1.5	2.0	1.5	2.4	16,238
FN DE IRATI	1.5	2.0	2.9	2.1	2.0	3.5	2.0	2.5	2.3	2,191
PN DA AMAZÔNIA	3.0	2.0	3.3	2.8	1.0	2.5	2.0	1.8	2.3	1,112
PN DOS CAMPOS AMAZÔNICOS	3.0	2.0	2.8	2.6	2.0	2.0	2.0	2.0	2.3	-
PN CAVERNAS DO PERUAÇU	3.5	1.5	2.3	2.4	2.0	2.5	2.0	2.2	2.3	2,938
FN DE IBIRAMA	1.5	1.5	2.6	1.9	2.0	4.0	2.0	2.7	2.3	-
FN DE SILVÂNIA	1.5	2.0	2.8	2.1	2.0	4.0	1.0	2.3	2.2	1,110
FN DO AMAPÁ	3.0	2.0	2.6	2.5	2.0	2.5	1.0	1.8	2.2	-

Appendix I. (Continued)

Protected	Internal				External				Final	Visitors 2015
Area	P	S	M	O	P	S	M	O	Class	
PN DO MONTE RORAIMA	4.5	2.5	2.5	3.2	1.0	1.5	1.0	1.2	2.2	2,174
PN DO CABO ORANGE	3.5	1.5	2.5	2.5	1.0	2.5	2.0	1.8	2.2	-
PN SERRA DE ITABAIANA	2.0	1.0	1.9	1.6	3.0	3.0	2.0	2.7	2.1	-
FN DE CAPÃO BONITO	1.5	1.0	2.0	1.5	1.5	3.5	3.0	2.7	2.1	-
PN DO JURUENA	3.5	1.5	1.3	2.1	1.5	2.5	2.0	2.0	2.1	-
PN DA LAGOA DO PEIXE	2.5	2.0	1.7	2.1	2.5	2.5	1.0	2.0	2.0	4,923
PN DA SERRA DO DIVISOR	3.0	1.5	2.2	2.2	1.5	2.0	2.0	1.8	2.0	-
PN SERRA DA MOCIDADE	3.0	1.0	2.2	2.1	2.5	2.5	1.0	2.0	2.0	-
FN DE SOBRAL	1.5	1.0	1.7	1.4	2.0	3.0	3.0	2.7	2.0	-
PN GRANDE SERTÃO VEREDAS	3.0	1.5	2.1	2.2	1.5	2.0	2.0	1.8	2.0	570
PN DA CHAPADA DAS MESAS	2.5	1.5	1.5	1.8	2.0	2.5	2.0	2.2	2.0	-
PN DO ALTO CARIRI	2.0	1.0	1.0	1.3	2.5	2.5	3.0	2.7	2.0	-
FN DO TAPAJÓS	2.5	1.5	2.3	2.1	2.0	2.5	1.0	1.8	2.0	-
FN DE ANAUÁ	3.0	1.0	1.7	1.9	2.0	2.0	2.0	2.0	1.9	-
FN DO JAMARI	2.0	1.0	2.6	1.9	2.0	3.0	1.0	2.0	1.9	-
PN DA SERRA DO PARDO	2.0	1.0	1.6	1.5	1.5	2.5	3.0	2.3	1.9	-
PN DO PANTANAL MATOGROSSENSE	2.5	1.5	2.1	2.0	1.0	2.0	2.0	1.7	1.8	140
PN SERRA DA CUTIA	1.5	1.0	2.0	1.5	1.5	2.5	2.0	2.0	1.8	-
PN NASCENTES DO LAGO JARI	2.5	1.0	2.3	1.9	1.5	1.0	2.0	1.5	1.7	-
FN DE RORAIMA	2.0	1.0	1.7	1.6	2.0	2.5	1.0	1.8	1.7	-
FN DO AMANA	1.5	1.0	2.2	1.6	1.0	2.5	2.0	1.8	1.7	-
FN DE TEFÉ	2.0	1.5	2.3	1.9	1.0	2.0	1.0	1.3	1.6	-
FN DE HUMAITÁ	2.5	1.0	1.6	1.7	1.5	2.0	1.0	1.5	1.6	-

Protected	Internal				External				Final	Visitors 2015
Area	P	S	M	O	P	S	M	O	Class	
PN DO JAMANXIM	2.5	1.0	1.0	1.5	1.0	2.0	2.0	1.7	1.6	-
FN DE SARACÁ-TAQUERA	1.5	1.0	2.5	1.7	1.0	2.5	1.0	1.5	1.6	-
FN DO CREPORI	2.0	1.0	1.3	1.4	1.0	2.0	2.0	1.7	1.6	-
FN DE PAU-ROSA	2.5	1.0	1.6	1.7	1.0	2.0	1.0	1.3	1.5	-
PN DE PACAÁ'S NOVOS	1.5	1.0	1.4	1.3	1.5	2.5	1.0	1.7	1.5	-
FN MAPIÁ - INAUINI	2.0	1.0	1.3	1.4	1.5	2.0	1.0	1.5	1.5	-
FN DE MULATA	2.0	1.0	1.7	1.6	1.0	2.0	1.0	1.3	1.4	-
FN DO AMAZONAS	3.0	1.0	1.0	1.7	1.0	1.5	1.0	1.2	1.4	-
FN DO JATUARANA	1.5	1.0	1.0	1.2	1.0	2.0	1.0	1.3	1.3	-

P - Physical, S - Social, M - Managerial, O - Overall

Chapter 5

**BUILDING CAPACITY FOR PROTECTED
AREA PUBLIC USE MANAGEMENT
AND PLANNING THROUGH A
MULTI-THREADED PARTNERSHIP**

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ABSTRACT

Increasing and diversifying demands on protected areas (e.g., for ecosystem-based services, visitor opportunities, conservation of natural and cultural heritage, economic development, etc.) has stressed many of

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the globe's national systems for governing and managing protected areas. This growth also comes with increased dependency on protected areas as cornerstones of national and international agency strategies for conserving biodiversity. Brazil is no exception, and like many other countries, economic crises and governance priorities have limited its ability to respond appropriately and effectively to emergent, complex and often conflicting demands and social expectations. These challenges are considerably more significant given Brazil's substantial role in protecting and managing its tropical and subtropical biodiversity, accelerating the need for effective stewardship. In particular, the rising engagement of both Brazilian's and their international guests with protected areas require staff with skills, competencies and values that empower them to work with local communities and tour operators while also protecting natural heritage. As a result of these challenges, the U.S. Forest Service (USFS) and U.S. Agency for International Development (USAID) developed a partnership involving the Chico Mendes Institute for Biodiversity Conservation and other NGOs and universities to enhance the capacity of Brazil to manage its critical natural heritage. This partnership involves several dimensions: (1) demonstrating best practice in planning and management of visitor use on public lands; (2) building technical capacity among federal and state level protected area managers oriented toward public use management; (3) facilitating university collaboration to create and disseminate knowledge about public use, communities and protected areas; and (4) demonstrate the usefulness of information technology to monitor visitor use. This partnership has resulted in infrastructure development in and near the Tapajos National Forest, establishment of public use management courses, tools and regulations developed and strengthened capacity for ICMBio, the development of a new inter-university collaborative (and this book), and a series of studies characterizing visitation to several protected areas.

INTRODUCTION

The world over, protected areas are the significant cornerstone in the race to protect the earth's remaining biodiversity. Over 200,000 nationally recognized protected areas exist in the World Conservation Monitoring Centre database maintained by the U.N. Environmental Program (UNEP-WCMC and IUCN 2016). These areas represent about 14.7% of the terrestrial surface of the earth and 10% of the global marine area. They encompass a variety of protection strategies. And yet, for many reasons, the natural heritage contained within these protected areas remains stressed and

even threatened. For example, increased demand for minerals and energy resources sometimes result in de-gazetting all or parts of a protected area; communities in bio-rich locations are often poor and rely directly on natural resources, such as fish, thatching grass and medicinal plants needed for basic sustenance and shelter; management of these uses may or may not lead to sustainable outcomes; and global climate change is shifting the geographical location of genetic resources to places outside of existing protected area boundaries.

Brazil protects, in its national system of parks, forests and reserves, over 2.5 million km² of its terrestrial and marine landscape, accounting for about 30% of the country's terrestrial and marine surface. These areas are located in a variety of national and state parks, ecological stations, sustainable development areas, extractive reserves and indigenous reserves; each category holding somewhat different goals and objectives with respect to biodiversity protection, community development, access and use of natural resources and public use. Within the legal Amazon (an area defined by Brazilian statute, approximately 5 million km² in size), about 40% of the terrestrial landscape is located within designated protected areas.

The significance of this protection to the globe is hard to underestimate: one fourth of the world's freshwater is produced in the Amazon; it is home to one third of the earth's species and one-fifth of the globe's forests are located there. In sum, about 10% of all the area protected across the globe is located within Brazil. This makes the effective management of the parks and reserves in Brazil of global importance.

These protected areas exist within a loose system of federal, state and local public management agencies and private reserves, principally among them the Chico Mendes Institute for Biodiversity Conservation (ICMBio for its Portuguese language name Instituto Chico Mendes de Conservação da Biodiversidade). ICMBio was established in 2007 to focus on conservation activities and is administratively located within the Brazil Ministry of the Environment. However, the states, particularly Amazonas and Minas Gerais, also have systems of protection, and the city of São Paulo administers one of the largest urban parks in the world. These very special places exist, however, within a context of political and economic uncertainty, rising and

diversifying expectations about not only what these places produce, but also challenges in their governance. Managing these areas effectively requires not only a set of laws and policies that reflect the will of the Brazilian people with respect to their natural heritage, but also lies upon a foundation of technical and financial support from the international arena as well as qualified managers and planners to ensure conservation is effective.

Building managerial capacity is a particular significant step in ensuring protection and effective management of natural heritage. In the complex and dynamic societies of the 21st century, protected areas must be sensitively stewarded, mindful of the significant, and often irreplaceable natural heritage within them, the dependency of some local communities on them for shelter, sustenance and the income needed to function in a money-based economy, and the power of nature to produce visitor experiences that transform people. These goals require managers that are comfortable working in complex, dynamic and uncertain settings and can competently apply the best available science to addressing the challenges facing parks and protected areas.

Brazil is not immune from threats to its significant natural heritage particularly that which occurs in the Amazon basin. Illegal deforestation, climate change, expanding development (for example, hydropower) and advancing transportation, growing energy production, rising human populations and increasing expectations for forests to provide for local populations are major challenges that would stress the most competent protected area manager. Creating and strengthening human resources on the ground of PA system is one solution to the threats. Protected area management in the Amazon Basin is particularly challenged because of:

- the significance of its biodiversity to global efforts in conservation such as the Convention on Biological Diversity;
- uncertainty about the both the causes of stress and their consequences;
- the often remote and difficult to access locations of much of its biodiversity

- one of the lowest ratios of personnel to km² of protected areas in the world and lack of organizational resources relative to the organization's mission
- growing expectations for protected areas to support nature-based tourism as an economic development tool.

Building capacity is key to effective management, but it is only a necessary but not sufficient condition. Building capacity is an intermediate step to the ultimate goal of more effective functioning staff and as a result a system that is effectively protected and managed. In this paper, we wish to describe the USFS and Government of Brazil (supported by USAID and a variety of technical partners) program designed to develop capacity of protected area staff to effectively manage Brazil's natural heritage. We do this by:

- explaining what we mean by capacity development;
- turning to a discussion of some of the challenges Brazil faces in the conservation arena; and
- describing the capacity development program.

What Do We Mean by Capacity Development or Capacity Building?

Conservation strategies and frameworks have rarely, and only recently, included capacity development as a component or activity to be included in the notion of conservation (e.g., compare Groves et al. 2002 with Rodriguez et al. 2006). Many conservation frameworks thus implicitly assume that capacity to implement a strategy exists within local institutions and peoples. This assumption has been the subject of examination more recently, and as a result capacity development has been viewed as a major activity of conservation. For example, major conferences, such as the once a decade World Parks Congress, have increasingly turned their attention to building

capacity, particularly in light of the Leverington et al. (2010) finding that only perhaps 30% or so of the world's inventory of protected areas are effectively managed. Effective management means that an area's heritage is being managed so as to reduce or mitigate the consequences of negative human induced changes on that heritage, that it has a functional plan and staff needed to secure the values and manage human uses.

In this paper, we use the OECD (2006) definition of capacity as "the ability of people, organizations and societies to manage their affairs successfully." Such ability, with respect to protected areas involves abilities at several functional scales: governance, institutions, professional conservation staff, and within local communities and businesses. Because action in society requires differing actors working in various functions, all must be performing well for conservation to be effective. And the capacity involves ensuring that the goals established for protected areas are achieved.

Capacities, in this case a diverse set of competencies, skills, abilities, and knowledge, are built and developed through a variety of mechanisms, beginning with primary, secondary and tertiary education. The capacity built here prepares students in the basics of contemporary social literacy. At the adult level, trainings of all kinds including demonstrations, twinning, mentoring, job shadowing, workshops, self-directed reading and so on. But, what is the intent of all this activity? Here we again turn to OECD (2006) for a definition of capacity development, which "refers to the process whereby people, organisations and society as a whole unlock, strengthen, create, adapt and maintain capacity over time."

Both physical (e.g., law enforcement, interpretation) and conceptual and critical thinking skills (e.g., reflection, understanding tradeoffs, developing goals, creating alternatives, evaluating new challenges) are needed (e.g., see McCool et al. 2012) for successful public use management. These latter capacities are the less tangible ones and include capacities to:

- learn, focus and strategize;
- predict, adapt and respond to volatile and ever-changing contexts;
- motivate and inspire personnel;

- communicate effectively with internal and external constituencies; and
- learn and apply lessons learned to improve performance (Wigboldus et al. 2010).

Improving performance is the ultimate goal of building capacity, as capacity, as Cook (1997) noted, is a necessary, but not sufficient condition for performance. Managers must not only hold the technical skills, but also must be empowered or enabled to perform their tasks (McCool and Khumalo 2015). Managers must have confidence, as well as competence, they must also hold the understanding and wisdom to function in the complex and often volatile settings of 21st century protected area management. In sum, improved performance requires thinking critically, acting competently and deciding confidently (McCool 2015). Of course, other factors, such as the organization's learning environment are also fundamental.

Capacity development thus occurs within a complex, dynamic and uncertain context and as such a systems approach is needed to facilitate enhanced performance. Knowledge of how to do things is important, but understanding how things work in this setting is also critical (Ackoff 1996). Ultimately, developing capacity is one step of many that leads to protection of Brazil's natural heritage.

Brazil's Conservation Challenges from a Capacity Development Perspective

Many challenges confront protection of Brazil's diverse and significant natural heritage, management of tourism and public use. Verissimo et al. (2011), for example, cited a 2009 Interministerial ordinance calling for

Monitoring the execution of the investments in the Parnas [national parks], mainly with regards to the socioeconomic and environmental impacts of tourism in the municipalities where they are located; promoting the necessary adjustments for implementation of the actions provided for

in the Parnas and the respective areas of influence; defining strategies that foster greater proximity between the Parnas and Brazilian society; and establishing mechanisms for promoting tourism in the Parnas in an way integrated with the policies and other types of projects developed in these areas. (p 41)

While of course we argue that the challenge of planning and managing public use goes far beyond this brief statement, it does illustrate the need to build capacity to accomplish these tasks.

Parallel to the challenges of managing public use are ones equally significant that confront development capacity to manage natural heritage and public uses of it. Brazil is a large and diverse country, geographically, biophysically and socially. Brazil's population is about 200 million people, much of which is concentrated in the south and is highly urbanized with 21 cities of 1 million or more people. The legal Amazon is sparsely populated, with only about 25 million people, again with much of that population highly urbanized. Smaller communities are remote and difficult to access, with access often limited to boat or plane. There is a relatively low professional staff to area protected ratio. And staff have little professional education in public use management. These characteristics have several significant consequences:

- 1) The geographic separation of the population and Amazon biodiversity means that the population is largely spatially disconnected from this heritage, meaning that public use in national parks becomes a critical tool in developing political support for its proper management. The subtropical and tropical forests contain incredible floral and faunal diversity and yet while scientists the world over engage in research in the Amazon, still much remains to be known. The lack of knowledge may lead to infrastructure decisions that are inappropriate and potentially irrevocable.
- 2) Administration of protected areas remains a challenge. About 40% of the Brazilian Amazon, or about 2.1 million km² is gazetted into some kind of protection: national parks, sustainable development reserves, ecological stations, extractive reserves and indigenous

reserves. The latter accounts for nearly half of the area in protection. The wide variety of categories implies many different management objectives and philosophies, which need explication as part of the planning process. This step requires intimate interaction among planners, managers, the public, indigenous peoples and other stakeholders to chart a course and build public understanding.

- 3) Many of these areas are remotely located with access limited by poor roads or to boat only. This means that administration is difficult, time-consuming and inefficient compared to areas in the south of Brazil.
- 4) Both State and Federal protected areas generally have few staff for management, planning, operations, monitoring and enforcement, sometimes as few as 1 person for a million hectares of protection.
- 5) Rising and diversifying expectations place new demands on protected area management. For example, growing need for sustainable livelihoods in remote communities means new types of forest products are increasingly a component of local economies. And protected areas as the basis for nature-based tourism is a growing reality in the Amazon, yet managers (park chiefs, public use specialists and environmental analysts) have little background in public use management and planning. Finally, administration of protected areas is expected to be democratic, transparent, accountable and responsive to local needs.

Thus, poor access, lack of management capacity, varying types of protection strategies, diversifying demands and large scale of areas constitute a perfect storm challenging effective administration. The Amazon Region Protected Area (ARPA) programme, an internationally and cooperatively-funded program has assisted in improving administration and extending the area protected, but has not focused on building technical and planning facilitation skills. This situation accelerates the need for effective management, which requires not only good management plans, political will, and a sustainable financial foundation, but also managers who have

ownership in the plan, hold the technical capacity to implement them, and have the ability to facilitate constituency engagement.

The context for protected areas in the Brazilian Amazon is one of dynamic change, uncertainty, conflict and complexity. Each of these factors makes understanding a decision difficult and predicting consequences even more so. Various constituencies vie, compete and exert pressure for various outcomes from protected areas. In this context managers are faced with three systemic level tasks to achieve their mission to protect natural heritage:

- managing competing demands – many demands and expectations expressed by various publics are at least partly competing and partly overlapping. Managers are confronted with the question of what trade-offs are involved and how to rank outcomes;
- managing learning – because of the uncertainty involved, learning is essential to effective management. Such learning is not only through formal channels but also takes place as monitoring, assessment, and reflection; and
- managing relationships with constituencies – constituencies express demands and expect managers to respond to those expressions. How managers respond, both verbally and in action affects the quality of relationships.

The Brazil Partnership to Conserve Amazon Biodiversity

Out of this ever changing and complex context arose the need to take action to ensure conservation of biodiversity in Brazil's Amazon basin. While significant amounts, as noted above, of land area are designated as formalized reserves, forests and parks, designation alone does not ensure protection. Management is required to enforce rules, administer uses and prevent illegal exploitation and build the support of constituencies. In addition, the Central Amazon Conservation Complex World Heritage Site, designated by UNESCO, imposes upon Brazil an obligation to protect the Outstanding Universal Value recognized in the World Heritage Inscription.

Under USAID/Brazil's current biodiversity conservation program, which forms a significant part of the US and Brazilian Government strategic partnership, USAID works in close partnership with the Government of Brazil through a Development Objective Grant Agreement (DOAG), signed in August 2014. Thus, USFS is a technical implementing partner under the biodiversity program supporting the Partnership to Conserve Amazon Biodiversity. At the federal level within the Government of Brazil, the key agencies for USAID and USFS support are the Chico Mendes Institute for the Conservation of Biodiversity (ICMBio); National Indian Foundation (FUNAI) and the Ministry of Science, Technology and Innovation (MCTI). Regional and state level agencies such as Environmental Secretariats, Forest Institutes and their managers are also a focus in selected geographic areas. Activities are also designed to support and complement ARPA financial assistance and priorities.

The lead technical agencies under the USAID PCAB program are the USFS, ICMBio and FUNAI. These agencies are supported by the U.S. National Park Service and several U.S. and Brazilian universities. The Initiative's overarching goal is "enhanced biodiversity conservation for Brazilian Amazon protected area systems." There are three sub-purposes:

- 1) Strengthened biodiversity conservation efforts in priority protected areas;
- 2) Improved indigenous community and other key actor protection of indigenous lands and natural resources; and,
- 3) Increased application by government, academia, and other key partners of science, technology and innovation to improve conservation.

These sub-purposes are achieved through an integrated program that emphasizes (1) capacity building; (2) sustainable livelihood strategies; and (3) public use and management planning; and (4) fire prevention and management. The program is focused on technical assistance not funding and is designed for a five-year period that began in Fiscal Year 2014. In this

paper, we describe the capacity building and public use components as they are strongly linked. These components are achieved by programs that:

- 1) Demonstrate public use best management practices for connecting Brazilians with their natural heritage through interpretive programs and infrastructure;
- 2) Enhance professional competency to protect biodiversity and protected areas through best practice in planning;
- 3) facilitate university collaboration to create and disseminate knowledge about public use, communities and protected areas.

A fourth program area focusing on demonstrating best practices in monitoring visitor use is described in the Garcia, Moreira and Burns chapter.

A Review of Activities

At the current point in time, late 2016, the activities of the Partnership encompass four major thrusts, each of which will be briefly presented. The activities of this technical assistance program involve several dimensions which are presented below.

Demonstrating Best Practices: The Tapajós National Forest and Local Communities

Beginning in 2014, ICMBio and the USFS began a series of investments in to demonstrate best practices in public use planning and infrastructure in the Tapajós National Forest. The Forest encompasses about 550,000 hectares and is located south of the city of Santarém in Pará state, lying just to the east of the Tapajós River, a major tributary to the Amazon. It represents typical lower Amazon Basin forest and biodiversity as well as containing a number of small traditional and indigenous communities heavily reliant on natural resources. The overall management goal of the Forest is sustainable use of forest resources and values, including tourism. The demonstration project was designed to build managerial experience with

best practices in programs to raise public awareness of tropical forests and encourage visitor use at several locations, most prominently in the Terra Rica area and near the communities of Margaury, São Domingo and Jamaragua.

The project involved three major aspects: Development of an interpretative trail in the Terra Rica area, focusing on understanding of tropical forest biodiversity, development of a visitor information center for the Forest in the resort community of Alter do Chão, and working with the three communities mentioned above to develop a trail corridor and visitor access infrastructure. Each of these aspects involved building capacity of ICMBio staff and local community members through formal workshops and seminars, mentoring and collaborative planning and implementation of projects. The project is described in more detail in Lippitt and Finchum (this book).

Enhancing Professional Competency

Conservation involves more than simply drawing lines around areas and hoping nature will take care of itself. Building the connections between civil society and nature that the Partnership envisions requires active engagement and management of society's expectations and demands, relationships with constituencies, and learning (McCool et al. 2012). This in turn is built upon a cadre of conservation staff that hold the needed skills for management in the 21st century. In this context, the skills needed are oriented toward management of public use (primarily visitation for recreation and education). As noted earlier, the objectives of the capacity development program involve building critical thinking skills, developing technical competency in public use and general management planning, and creating a sense of confidence in the application of skills and problem solving.

Classes and workshops that helped build competencies are shown in Tables 1 and 2. During the period from January 1, 2014 to September 30, 2016 about 300 ICMBio staff, Amazonas, Minas Gerais and Pará States staff, university faculty, staff from local non-government organizations and municipalities and communities and private businesses participated in these classes.

Table 1. Courses and workshops offered in Brazil by the Partnership. Some courses have been incorporated into ICMBio's training program

Course/Subject	Principal Capacity Goal	Substantive Objective
Interpretation/Guiding (Several)	Skill Development	Develop Knowledge and Skills To Interpret Natural Heritage
Concessions Management (2)	Skill Development/ Confidence Building	Introduction to Concessions Management/Identify Best Practices
Advanced Public Use Planning	Critical Thinking/ Confidence Building	Application of Visitor Use Management Frameworks
Best Management Practices for Forest Trails and Roads	Skill Development	Develop knowledge and technical skills on establishing trails and roads
Management Planning	Skill Development/ Confidence Building	Best Practices in Building Effective Management Plans
Tourism Development and Management in Amazon Protected Areas		Application of Frameworks And Tools To Use Management Challenges
Visitor Impact Monitoring		Contemporary Monitoring Techniques

Table 2. Courses offered in the United States in which ICMBio HQ conservation unit and NGO unit staff have participated

Subject/Course	Principal Capacity Goal	Substantive Objective
Tourism and Protected Areas Seminar	Critical thinking/ Confidence building	Exposure to best practices in public use management
Interpretation and Host Certification	Skill development	Certify interpretative trainers to operate in Brazil
International Seminar on Protected Area Mgmt (CSU)		Exposure to best practices
International Seminar on Protected Area Mgmt (UM)	Critical thinking	Exposure to best practices and problem solving

Several of the classes have been taught more than once because of the demand and needs for capacity building. Importantly, the classes have not been “one-off” but rather a sequence of different subjects designed to build competency. The classes, because most of the facilitating faculty were the same individuals over time has also led to enhanced interpersonal and professional relationships, thus building trust, generating respect, creating a sense of ownership in the capacity development program, and leading to a professional approach to public use management. These characteristics are fundamental to an effective partnership program.

Facilitating University Collaboration for Protected Area Stewardship

A third dimension of the capacity development program has been to enhance collaboration in research and service for protected area management among both Brazilian and U.S. university faculty. Research and service is an important component of building capacity: research provides an important source of knowledge for understanding public use, its management, and making connections between Brazilian society and its natural heritage. This project helps not only disseminate research results and its meanings, but also involves engaging managers to better understand opportunities and challenges and in solving problems.

This collaboration focuses on joint research, such as that engaged by the State University of Ponta Grossa and West Virginia University that emphasizes monitoring of visitor use of protected areas and studies of visitor experience (see for example, Garcia, Moreira and Burns, this volume), or the work of the University of São Paulo and the North Carolina State University emphasizing the biophysical impacts from visitor use. It also involves short exchanges among universities for guest lectures and writing collaboratives. This cooperation involves a long-term investment in working with people in different settings with different languages and different ways of framing research initiatives. Transcending these situations results in powerful, useful insights (see van Wyk et al. 2008), builds a relevant Brazil centric literature need for university level instruction, and strengthens problem solving capacities.

CONCLUSION

Building capacity is a long-term effort, requiring investments in several threads coordinated to develop understandings, create demonstrations of best practice, foster critical thinking, and enhancing confidence. Within the realm of public use management in protected areas, these capabilities are particularly needed as people begin to make connections between themselves and their natural heritage, especially in situations where much of the population is urbanized and apparently insulated from it.

In Brazil, the significance of its Amazonian natural heritage places additional pressure on managers who face complex challenges, administer areas from remote and often isolated offices, see many opportunities, and must function on their own much of the time. Building capacity in the technical realm is one necessary step out of many needed to enhance the performance of management in making and managing connections between civil society and its natural heritage. Public use management is not just a science, but it is skilfully applied artist's paintbrush that holds implications for those in the distant future as well as those tourists visiting tomorrow.

We have found that working cooperatively in framing the capacity development problem, engaging local managers and academics, focusing on long term integrated programs and developing interpersonal relationships are key to building that capacity. Enhancing manager performance is a function of the organization itself and whether its policies, human resources management, incentives and delegation of decisions makes it possible for its staff to perform at higher levels. Finally, the lessons learned from capacity building have implications for building managerial capability among U.S. protected area managers. Testing new ideas in organizational policies, such as encouraging learning, will help in enhancing performance.

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Chapter 6

**PUBLIC USE, BIODIVERSITY, AND
NATIONAL PARK MANAGEMENT
IN BRAZIL AND THE UNITED STATES**

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ABSTRACT

We conducted a comparative analysis of the effectiveness of national park management in the National Capital Region of the National Park Service of the United States and the Chico Mendes Institute of BioDiversity Conservation (ICMBio) Administrative Region CR-8 of Brazil consisting of all national parks in the state of Rio de Janeiro. Our objectives were to measure, from the perspective of park managers, management strategies in national parks under different levels of

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management intensity and public use, and the effect of public use on biodiversity conservation in national parks of the two regions. The RAPPAM (Rapid Assessment and Prioritization of Protected Area Management) survey instrument was administered between 12 March and 26 June 2013. Unique to the current study was development of a set of 10 queries designed to investigate the relationship between public use and biodiversity conservation in national parks. Strong points of park management in both regions included management objectives, park site design, and biological importance of park assets, among others. The biggest differences between the two regions dealt with park vulnerability, legal security of parkland, and infrastructure. Other differences dealt with tourism importance, communication and information, and research. Managers of U.S. parks, with double the number of annual visitors compared with Brazilian parks, indicated that biodiversity was still being conserved. Tourism did not figure among the main pressures and threats of sampled parks in either the U.S. or Brazil.

Keywords: tourism, ecotourism, public use, biodiversity, conservation, park

INTRODUCTION

Brazil and the United States (U.S.) have established notable national parks. In both countries, national parks were designated to maintain the natural qualities of defined areas and to be enjoyed by people. Differences between the two countries exist, however. Park sizes tend to be smaller in the U.S. than in Brazil but with more employees, and parks in the U.S. receive more visitors than do Brazilian parks. In addition, when Brazil created its first national parks, the areas had established human populations. U.S. park areas were largely remote and lacked substantial human populations at time of park designation (Drummond 1997; Diegues 2001; Vallejo 2005).

Our interest in national park management focused largely on the effects of visitor use on biodiversity conservation in national parks as perceived by park managers and implications of the results for management of national parks. Is public use incompatible with biodiversity conservation in national parks? To investigate this question, we studied national parks with low public use (Brazil), and national parks with high public use (U.S.).

STUDY AREAS AND METHODS

In the U.S., parks sampled were in the Administrative Region known as the National Capital Region of the National Park Service, including parks in the states of Maryland, Virginia and West Virginia, and Washington, DC. Brazilian parks studied were within the ICMBio (Brazilian Protected Areas Administration Agency) Administrative Region CR-8, comprising all national parks of the state of Rio de Janeiro. The two regions had similar characteristics. Both were located along the Atlantic Ocean coast, had large bays (Guanabara and Chesapeake), and both contained large urban centers. In the U.S., parks sampled were Chesapeake and Ohio Canal National Historical Park, Assateague Island National Seashore, Prince William Forest Park, Catoctin Mountain Park, Harpers Ferry National Historical Park, Great Falls Park, and Rock Creek Park. In Brazil, parks sampled were Itatiaia National Park, Serra dos Orgaos National Park, Tijuca National Park, Serra da Bocaina National Park, and Jurubatiba Restinga National Park.

The RAPPAM (Rapid Assessment and Prioritization of Protected Area Management) survey instrument was used in this study (Ervin 2003a). The methodology was developed by the World Wildlife Fund and has been used in 53 countries and more than 1,600 protected areas in Europe, Asia, Africa, Latin America and the Caribbean, with emphasis on developing countries (Leverington et al. 2010). RAPPAM has been widely used as a means of assessing the management effectiveness of protected areas.

The survey questionnaire was completed by park managers with input from other park officials and specialized staff. It was made clear to park personnel that the answers should reflect the consensus views of all staff of the park, not just views of the individual completing the survey. In many cases, information was available from park management documents. Most park personnel completed the questionnaire in 30-45 days. Meetings with park officials and administration of the questionnaire occurred between 12 March and 26 June 2013.

Unique to the current study was development of a set of 10 queries designed to investigate the relationship between public use and biodiversity

conservation in national parks. The queries were carefully constructed to follow the same pattern of other sections in the RAPPAM methodology. Also added to the survey were questions about the number of annual visitors to the parks and the economic benefits of the parks to surrounding communities.

The RAPPAM methodology organization was structured into five elements of planning, management and evaluation, as follows: context, planning, inputs, processes and outputs. Each of these elements is composed of specific themes and issues covered in different thematic modules (Ervin 2003a)

For the 15 elements of the RAPPAM questionnaire (Table 1), queries had four response options: “yes,” “mostly yes,” “mostly no,” and “no.” “Yes” and “mostly yes” were combined as positive responses or strengths, and “no” and “mostly no” were combined as negative responses or weaknesses. For each of the 10-question elements (numbers 1-4 and 15 of Table 1), the ratio of “yes” to “no” responses could be 10 “yes” and 0 “no,” 0 “yes” and 10 “no” or some combination of the two. Totaling responses for each of the 10-question elements for the seven U.S. parks resulted in ratios of “yes” to “no” that summed up to 70. For Brazilian parks, ratios of “yes” to “no” summed to 50 (Table 1). For the remaining 5-question elements (numbers 5-14 of Table 1), the ratio of “yes” to “no” responses could be 5 “yes” and 0 “no,” 0 “yes” and 5 “no,” or some combination of the two. Totaling responses for each of the 5-question elements for the seven U.S. parks resulted in ratios of “yes” to “no” that summed to 35. For Brazilian parks, ratios of “yes” to “no” summed to 25 (Table 1). We used Fisher’s Exact Test (Cherkassky and Mulier 2007) to analyze differences between Brazil and the U.S. for each of the 15 elements.

For Figure 1, the maximum possible score was 50 for each of the two elements (park vulnerability and tourism importance). Each element listed 10 queries to which park managers could respond. Responses could be “yes,” “mostly yes,” “mostly no,” or “no.” A “yes” response equaled 5 points, a “mostly yes” response 3 points, a “mostly no” response 1 point, and a “no” response zero points. Responses were totaled for each of the 10-query elements for each of the five parks. Figure 2 was derived from the data of

Table 1 and expressed as the percent of strong responses to total responses for each of the 15 elements for each country.

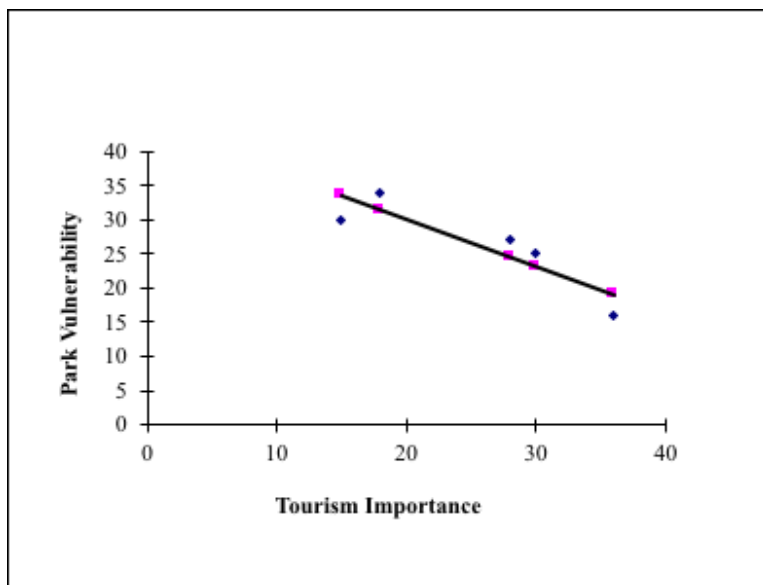


Figure 1. Relationship between tourism and vulnerability of park resources in Brazil, 2013.

RESULTS AND DISCUSSION

Park Objectives and Site Design

Park objectives and site design were strong in both Brazil and the U.S., and for the most part, were similar in the two countries (Table 1). All parks in Brazil and six of seven parks in the U.S. reported that park objectives provided for the protection and maintenance of biodiversity. All parks in both countries stated that management policies and plans were consistent with park objectives and park employees and administrators understood park objectives and policies. All parks in Brazil and four of seven in the U.S. reported that specific biodiversity-related objectives were clearly stated in

the management plan. Local communities supported overall park objectives for all parks in the U.S. and three of five parks in Brazil. Two parks in Brazil reported no local community support or community disagreement with the goals expressed in park management plans. These data likely reflect conflict in the relationship between communities and parks where territory and park boundary issues, and the authoritarian and disjointed government actions, were in dispute (Prado 2000; Mendonca and Fontoura 2010; Ferreira 2011). The issue is discussed further under *Tourism and Vulnerability of Park Resources*.

Pressures and Threats

Results in this study corroborate research of Brandon (1998), Terborgh et al. (2002), Ervin (2003b), and Nchor and Ugogo (2012) that show a long list of pressures and threats faced by protected areas. Some are resurgent and deserve special attention. According to Wilson (1992), and Friedman and Zube (1992), the greatest threats can be differentiated into four categories: overfishing, habitat destruction, the introduction of alien species and the spread of diseases carried by exotic species. In this study, problems with exotic species ranked high in both Brazilian and U.S. national parks sampled (Fontoura et al. 2016). In the U.S., 50% of the species listed as threatened or endangered are at risk because of invasive alien species (Wilcove et al. 1998). The threat is global and is classified as intractable because of the scale of the problem.

In U.S. parks sampled in this study, the white-tailed deer (*Odocoileus virginianus*) was listed among the top pressures and threats (Fontoura et al. 2016). The species is native to North America and historically was a major food source for Native Americans. European settlers in North America also depended heavily on white-tailed deer for food. Few regulations existed on hunting of deer into the early 1900s. As a result, deer populations were greatly reduced. The species was extirpated from most of the state of Maryland by the early 1900s and found only in the western part of the state. Conservation efforts and reintroduction of the species throughout the state

began in 1920. With these measures, and strong enforcement of hunting regulations, the deer population prospered (Maryland 2009). In some parks in recent years, excessive numbers of deer have led to ecological damage and other negative impacts. The most effective means of controlling populations of deer in the parks is through regulated shooting (culling) programs. Hunting in national parks is not allowed. Although controversial, culling programs, sometimes combined with fertility control measures, have been implemented in a number of parks.

For Brazilian national parks, the main pressures and threats were identified as illegal hunting (poaching), habitat fragmentation, and exotic species. Poaching was a top pressure and threat in Brazilian national parks sampled (Fontoura et al. 2016). Although prohibited, illegal hunting and trafficking of wild animals in Brazil are still widely practiced. Protected areas are the last refuges of animals and are targeted by hunters. The inspection limitations and old laws are barriers to reduce hunting in the country (RENECTAS 2001). Poaching affects over 80% of the parks in 16 tropical countries on three continents (Van Schaik et al. 1997).

Collection of non-timber forest products (NTFPs) also ranked high as a pressure and threat, scoring 14 and 5.6, respectively, in Brazilian parks sampled (Fontoura et al. 2016). Combining poaching with NTFP yielded scores for pressures and threats of 35 and 24.2, respectively, in Brazilian parks sampled. According to Ervin (2003b), poaching and collection of NTFPs are related to the systematic removal of plants and animals. This may mean a ripple effect through different trophic levels. At the extreme, if not regulated, this activity can lead to extirpation and extinction of species.

Tourism did not figure among the main pressures and threats of sampled parks in either the U.S. or Brazil (Fontoura et al. 2016), despite an average of 1.5 million visitors annually using the sampled parks in the U.S., and an average of 742,000 people visiting sampled Brazilian parks. Of the latter, most individuals were recorded only in Tijuca National Park and the vast majority of these folks were only interested in visiting the Statue of Christ the Redeemer. Based on these results, and others reported later in the chapter, we believe there is growth potential for sustainable tourism in Brazilian national parks without sacrificing biodiversity conservation.

Results in this chapter support findings of Ervin (2003b), Li and Han (2001), and Nchor and Ugogo (2012) reported for other countries where tourism was considered a minor or moderate threat. Other less important pressures and threats like mining, pollution, and fishing were discussed in Fontoura et al. (2016), along with mitigation and management practices in both countries.

Tourism and Biodiversity Conservation

Park managers in both Brazil and the U.S. placed high value on the biological importance of parks (Table 1), which support findings of others (Hockings et al. 2000; Hockings 2003). Managers in both countries reported that the natural features and characteristics of parks (including their biodiversity) were being maintained with the current level of public use and that parks were not too developed. Nonetheless, in our view, park managers should be vigilant and initiate plans for limiting the number of visitors if necessary to maintain park biodiversity. Most U.S. park managers reported that they had such capability, but three of five parks in Brazil lacked such capability. Monitoring visitor impacts on the natural features and characteristics of parks also was a weakness in Brazil. We believe park managers in both countries should monitor the impact of visitors on the natural features and characteristics of parks, be aware of any negative impact of park visitors on biodiversity, and have the capability of limiting the number of park visitors if needed.

Parks in Brazil and the U.S. have shown good results with regard to conservation. Exotic species remain a problem in both countries. In addition, Brazilian parks require specific actions for monitoring and combating illegal hunting. Illegal hunting in American parks is not a large issue, although poaching of black bears (*Ursus americanus*) for body parts, and other offences, does occur. Strong law enforcement helps to deter such activity in the U.S. Tourism was not perceived as a major threat to biodiversity by park managers in either Brazil or the U.S.

Tourism in national parks was considered more important in the U.S. than it was in Brazil ($P = 0.05$) (Table 1). Park managers in both countries

felt that tourism in parks contributed to environmental education of visitors and was an economic benefit to park operation and maintenance, and that parks were beneficial to local populations in surrounding communities. The importance of parks in contributing to environmental education of park visitors supports the findings of others (Takahashi 1998; Rodrigues 2009). Although park managers in Brazil considered parks beneficial to local populations in surrounding communities, historically, there has been conflict between the establishment of parks and the presence of local communities (Diegues 2001). In Brazil, this issue is important and recurrent, and almost all national parks have land tenure problems (Drummond 1997; Rocha et al. 2010). The issue is discussed further under the section below.

Tourism and Vulnerability of Park Resources

The vulnerability of parks indicates how parks are susceptible to external pressures or illegal activities that threaten biodiversity conservation. Parks in Brazil were more vulnerable ($P < 0.01$) than parks in the U.S. (Table 1). Of the ten questions presented, seven demonstrated an average difference greater than 40%.

In Brazil, but not in the U.S., recruitment and retention of employees was difficult. Part of this difficulty may be in the contracting strategy of officials at ICMBio (only accomplished through public tenders) or the bureaucratic complexity of establishing contracts and bids with service providers. Studies conducted by Medeiros et al. (2011) showed that Brazil was among the worst countries in the world in the relationship between the protected surface and the number of employees. At the time of this study, the U.S. had one federal employee for every 108 ha of parkland, whereas in Brazil the ratio was one federal staff member for every 2,543 ha (Table 2) (Medeiros et al. 2011).

Law enforcement was low in Brazil but high in the U.S. Three of five park managers in Brazil reported low law enforcement in parks. One of seven managers in the U.S. reported low law enforcement. Four of five managers in Brazil reported that staff and financial resources were not

adequate to conduct critical law enforcement activities. In the U.S., three of seven managers reported inadequate resources. Low law enforcement can create favorable conditions for illegal activities and increase the vulnerability of parks.

In Brazil, the biggest problems reported with regard to vulnerable resources were associated with heart of palm extraction (Açaí palm *Euterpe oleracea* and other species) and the trafficking of wild animals, especially birds, reptiles, and small mammals. The greatest obstacles to combating wildlife trafficking were the lack of vehicles, appropriate equipment, and training (Renctas 2001). The problem could be minimized with investments in infrastructure and skilled personnel.

With regard to cultural practices, beliefs and traditional uses of park resources by the surrounding populations, none of the American parks reported conflict with the goals of the protected areas, however, 80% of the parks studied in Brazil said that cultural practices and traditional uses conflicted with conservation objectives. Further studies are needed to understand what uses and conflicting practices interfere with park objectives.

When asked about the difficulty of monitoring illegal activities within the protected areas, 57% of U.S. park managers and all Brazilian park managers said parks were difficult to monitor. Parks studied in both countries were easily accessible for such activity.

Disagreements regarding land tenure or use rights and park boundary demarcation (legal security, Table 1) also differed ($P < 0.01$) between Brazil and the U.S. In Brazil, all park managers reported disagreements regarding land tenure or use rights and problems with park boundary demarcation. This is a systemic problem and must be worked out as a priority for the success of management in Brazilian national parks. In the U.S., the majority of managers did not report such disagreements or problems. The majority of managers in both countries reported that conflicts with the local community were resolved fairly and effectively and that parks had long-term legally binding protection. In Brazil, however, 40% of the parks sampled had no support from local communities and all had land problems on the borders.

Further study of this issue is needed, especially information from local communities.

Park managers in Brazil (three of five) felt that tourism (by the presence of people) decreased illegal activities in parks such as poaching, deforestation, and setting of fires. U.S. park managers (three of seven) were more neutral on this issue. In U.S. parks, law enforcement was considered strong and perhaps managers' responses reflected this. A negative relationship ($P = 0.04$) between tourism importance and park vulnerability in Brazil (Figure 1) quantifies these observations.

Tourism and Socioeconomic Benefits

The socioeconomic importance of parks in Brazil and the U.S. was similar ($P = 0.35$) (Table 1). In both Brazil and the U.S., parks had high recreational, educational, and/or scientific value, and possessed unusual features of aesthetic importance. Parks also contributed significant ecosystem services and benefits to communities in both countries. Also in both countries, local communities were not dependent upon park resources for their subsistence, parks did not provide community development opportunities through sustainable resource use, and parks did not have religious or spiritual significance. Parks in Brazil, but not in the U.S., were important sources of employment for local communities.

The greatest difference between Brazil and the U.S. regarding socioeconomic issues dealt with the social, cultural, or economic importance of plants. Four of five parks in Brazil stated that parks contained plant species of high social, cultural, or economic importance. Only one of seven U.S. parks made such a claim. Brazilian parks were created in areas of remaining forest, where communities historically used a long list of plants present in the national parks that were published in a popular pharmacopoeia. This may have contributed to the high importance placed on plants in Brazil.

Table 1. Similarity and difference between Brazil and the United States with regard to 15 important elements of national park management, 2013

Item	Significance ^a	Response	Brazil	U.S.
Biological Importance (P = 0.09)		Strong Weak	45 5	54 16
Tourism Importance (P = 0.05)	*	Strong Weak	29 21	53 17
Socio-economic Importance (P = 0.35)		Strong Weak	30 ^b 19	36 34
Vulnerability (P < 0.01)	**	Strong Weak	17 33	56 14
Objectives (P = 1.00)		Strong Weak	23 2	31 4
Legal Security (P < 0.01)	**	Strong Weak	10 15	27 8
Site Design (P = 0.21)		Strong Weak	18 7	30 5
Staffing (P = 0.27)		Strong Weak	15 10	26 9
Communication/Information (P = 0.03)	*	Strong Weak	11 14	26 9
Infrastructure (P < 0.01)	**	Strong Weak	14 11	33 2
Finances (P = 0.29)		Strong Weak	11 14	20 ^c 13
Management Planning (P = 0.17)		Strong Weak	14 11	26 9
Decision-making (P = 0.12)		Strong Weak	24 1	28 7
Research (P = 0.04)	*	Strong Weak	9 16	23 12
Management Outputs (P = 0.15)		Strong Weak	32 18	54 16

^{***} P < 0.01; * P ≤ 0.05.

^bDoes not total 50 because one park left one of the 10 queries blank.

^cDoes not total 35 because one park left two of the 5 queries blank.

Social, cultural, or economic importance of animal species rated higher in U.S. parks than in Brazilian parks. No parks in Brazil reported that animal species had high social, cultural, or economic importance. Three of seven parks in the U.S. made such claims. This difference may reflect American interest in wildlife watching, which does not seem so well developed in Brazil. Bird watching and other wildlife watching attract many visitors to national parks in the U.S. For example, in the parks sampled in the National Capital Region of the U.S., white-tailed deer attract many viewers. Bird watching also is popular. At Assateague, it is the wild horses (*Equus caballus*) that are the big attractant.

The economic benefit of national parks in both Brazil and the U.S. was substantial, returning more than eight times the annual budgets of the seven U.S. parks and an even greater multiplier effect in Brazil (Fontoura 2014). Another measure of the economic benefit of national parks was apparent when the U.S. federal government shut down for 16 days in October of 2013 because of budget disagreement. National parks closed as well as other federal agencies. National park tourism is important to many state and local communities and, with the federal government shutdown, these economies were noticeably affected. During the shutdown, the National Park Service estimated a 7.88 million decline in overall park visitation resulting in a loss of \$414 million visitor spending within gateway communities across the country (Koontz and Meldrum 2014). Fourteen states were allowed to reopen national parks with state funding before the end of the federal shutdown. Each dollar of state funding spent during this time period generated an estimated \$10 in visitor spending (Koontz and Meldrum 2014). Medeiros et al. (2011) also pointed out the importance of protected areas to national and local economies.

Resources and Infrastructure

Overall, staffing strong points outweighed weak points in both Brazil and the U.S. (Table 1). In both countries, strong majorities of managers reported that park staff members had adequate skills to conduct critical

management activities and staff performance and progress on targets were periodically reviewed. All parks in Brazil and four of seven in the U.S. stated that training and development opportunities were appropriate to the needs of the staff.

Six of seven parks in the U.S., but only two of five in Brazil reported that staff employment conditions were sufficient to retain high-quality personnel. Both countries stated that the level of staffing was insufficient to effectively manage the area—four of seven parks in the U.S. and four of five parks in Brazil.

Table 2. Budget, area, and number of park employees

Park	Area (ha)	Annual budget Millions USD	Staff	Federal	Out-sourced	Temporary	Volunteer	Other
Assateague	15.170	US\$ 4.9	259	47	10	77	125	--
Catoctin	2.376	US\$ 3.4	--	--	--	--	--	--
C&O Canal	7.689	US\$ 8.69	81	68	5	8	0	--
Great Falls	323	US\$ 0.68	36	12	3	4	60	2
Harpers Ferry	1.475	US\$ 6.0	100	75	5	20	1000	--
Prince William	5.904	US\$ 3.33	77	28	9	20	20	--
Rock Creek	722	US\$ 8.0	65	59	0	6	--	--
Bocaina	104.000	-----	65	15	22	28	0	0
Itatiaia	30.000	-----	131	16	50	35	30	0
Serra dos Órgãos	20.024	US\$ 0.89	165	19	77	35	0	34
Jurubariba	14.922	US\$ 0.21	30	5	11	14	0	0
Tijuca	3.958	US\$ 2.13	205	13	100	13	50	29

Source: Author's elaboration.

A significant difference ($P < 0.01$) was noted between Brazil and the U.S. regarding park infrastructure (Table 1). Most managers in both countries reported that transportation infrastructure and field equipment were adequate to perform critical management activities. Most managers in Brazil, however, stated that maintenance and care of equipment was

inadequate to ensure long-term use, whereas all managers in the U.S. reported adequate maintenance and care of equipment. Most park managers in Brazil also stated that staff and visitor facilities were not adequate to perform critical management activities or appropriate to the level of visitor use, whereas most managers in U.S. parks reported the opposite. This response probably reflects the lack of attention given to attracting visitor use of parks as discussed above under *Tourism and Biodiversity Conservation*.

Research and Management

A significant difference ($P = 0.04$) was noted between Brazil and the U.S. regarding research, monitoring, and evaluation (Table 1). Majorities of managers in both countries reported that park staff had regular access to recent scientific research and advice, and that critical research and monitoring needs were identified and prioritized. Differences were noted, however, with regard to other issues. A majority of park managers (four of seven) in the U.S. stated that the impact of legal and illegal uses of the park were accurately monitored and recorded. Only one of five managers in Brazil made a similar statement. Also, four of seven managers in the U.S. reported that research on key ecological and social issues was consistent with the needs of the park. One of five managers in Brazil made a similar statement. These data confirm the need to strengthen the research of Brazilian parks.

A significant difference ($P = 0.03$) was noted between Brazil and the U.S. regarding communication and information (Table 1). A majority of managers in both countries reported that adequate means existed for collecting new data. However, five of seven managers in the U.S. stated that adequate systems existed for processing and analyzing data, but only two of five managers in Brazil reported the same. Differences also were noted regarding two other issues. A majority of managers in the U.S. reported that existing ecological and socioeconomic data were adequate for management planning, but only one of five managers in Brazil stated the same. Likewise, six of seven managers in the U.S. reported adequate means of

communication between field and office staff, but only two of five managers in Brazil stated the same. A majority of managers in both countries felt there was effective communication with local communities, but the limitation of the methodology used did not reveal the effectiveness and depth of communication.

Overall, strong points outweighed weak points in both Brazil and the U.S. for management planning (Table 1). Majorities of park managers in both countries reported the availability of comprehensive inventories of natural and cultural resources, and recently written management plans. A majority in each country also stated there was an analysis of, and strategy for addressing, park pressures and threats. Differences were noted, however, with two issues. A majority of park managers in the U.S. reported that they had a detailed work plan with specific targets for achieving management objectives, and that results of research and monitoring were routinely incorporated into planning. Most park managers in Brazil did not have detailed work plans and did not routinely incorporate research and monitoring into planning.

The management decision-making process was strong in both Brazil and the U.S. with solid majorities reporting positively on all issues (Table 1). Managers stated that the decision-making process was transparent and that there was effective communication between all levels of park staff and administration with clear internal organization. Also, park staff regularly collaborated with partners, local communities, and other organizations.

Management outputs—the specific products and services accomplished by park staff, volunteers, and community members—did not differ between Brazil and the U.S. (Table 1), with strengths outweighing weaknesses in both countries. A majority of park managers in both countries reported that, in the last 2 years, site restoration and mitigation efforts; visitor and tourist management; infrastructure development; and staff training, development, monitoring, supervision, and evaluation were consistent with pressures and threats, objectives, and annual work plan of the park. There was some inconsistency here regarding park infrastructure development. Elsewhere in the questionnaire, Brazilian park managers reported inadequate visitor and staff facilities (see *Resources and Infrastructure* above). We do not have an

explanation for this discrepancy at this time. Brazil was weak in other areas, including wildlife or habitat management, community outreach and education efforts, management planning and inventorying, and research and monitoring. U.S. parks were strong in all of these areas.

CONCLUSION

Analysis of the information provided in this chapter allowed us to make some inferences about the similarities and differences of sampled national parks in Brazil and the U.S., and to understand the correlation between tourism, biodiversity, socioeconomics and vulnerability of national parks. Although sample sizes were small, some trends were noted that might be confirmed by analyzing larger data sets in the future. For example, exotic species were noted as problems in both countries. Also continued development surrounding parks was of concern in both countries. Illegal hunting was an issue in Brazil but culling of overabundant white-tailed deer in the U.S. was practiced. Land issues regarding park boundaries and surrounding human populations were of concern in Brazil. Tourism did not figure among the main pressures and threats of sampled parks in either the U.S. or Brazil. Strong points of park management in both countries included management objectives, park site design, biological importance of park assets, decision-making process, and management outputs (Figure 2). The biggest differences between the two countries dealt with park vulnerability, legal security, and infrastructure. With regard to vulnerability, three of five park managers in Brazil reported that tourism in parks decreased illegal activities like hunting, deforestation and fires.

The legal security issue mainly refers to land tenure disputes and demarcation of borders in protected areas. The issue is old and complex, but must be solved by political and institutional effort. It is not possible to manage a national park without the legal domain of the territory.

A majority of park managers in Brazil reported that park infrastructure was inadequate for the current level of visitor use. This was not an important issue for managers in the U.S. We believe that additional investment in

infrastructure in Brazil would enhance visitor experiences and economic benefits to the country. Other differences regarding park management between Brazil and the U.S. dealt with tourism importance, communication and information, and research (Figure 2).

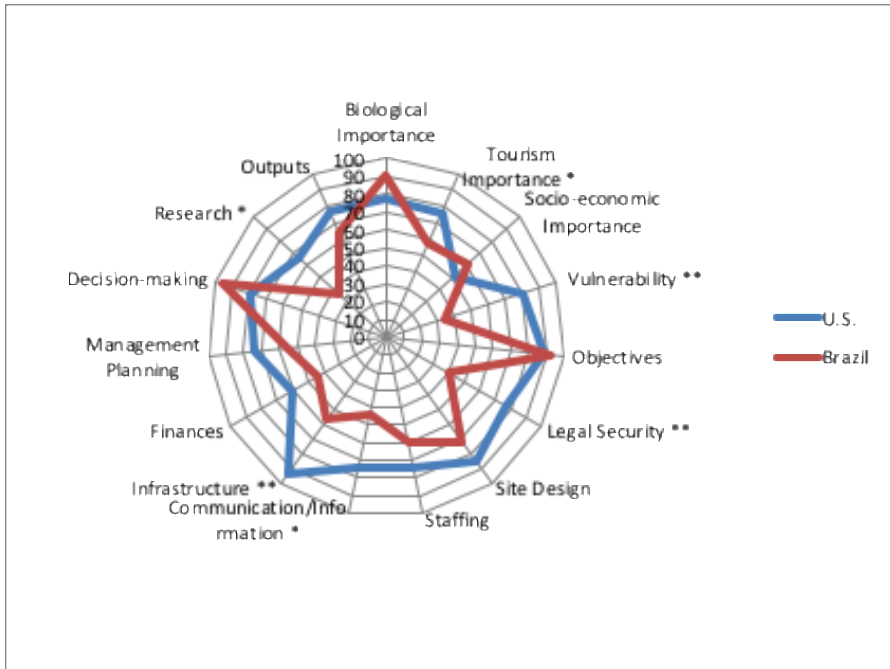


Figure 2. Park management effectiveness in Brazil and the United States.

Managers of U.S. parks, with double the number of annual visitors compared with Brazilian parks, indicated that biodiversity was still being conserved. In both countries, to maintain biodiversity with increased public use, we believe the following are needed: adequate park personnel, including law enforcement staff; adequate budgets to manage park resources and visitors, and; capability to monitor and limit public use if necessary.

In Brazil, if national parks were properly structured for tourism by improving facilities and services, there would be greater integration of the various interrelated economic sectors, contributing to increased regional

dynamism, creating jobs, and providing economic benefits without compromising the environmental and social services the parks provide.

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Chapter 7

MODELING VIEWSHED IN NATURAL AREAS: TOURISM PLANNING AND IMPLEMENTATION USING GIS

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ABSTRACT

Tourism in natural areas requires proper planning in order to avoid environmental impacts and provide visitors with spaces for leisure and nature contemplation. Hence, the identification of trails needs to consider areas with a greater visual outreach so that the most wanted natural attractions can be seen. -Geographical Information Systems (GIS) can contribute to planning because they bring into the landscape analysis the concept of viewshed, i.e., the visibility of the landscape from particular places. The viewshed of these places can be modeled using GIS. This approach can become integrated into planning for conservation when ecological concepts are added. In this study visible outlooks were mapped from the standpoint of the observer (viewshed) and of two natural attractions (reverse viewshed) in areas located at *Chapada dos Veadeiros* National Park (PNCV) and its surroundings. The research identified strategic spots inside the PNCV and areas called single spaces around the PNCV. The research involved more than identifying areas; it also included setting standards for results and about feasibility of application and flexibility for decision-makers. Results indicated the use of tools such as the GIS is a first step for recognizing areas with potential for tourism.

Keywords: viewshed, tourism, natural areas, landscape, trails

INTRODUCTION

What now are trails in protected areas once were informal pathways for hikers, or access routes to natural resources such as timber, water springs or pathways to reach hunting or fishing areas (Lechner 2006). After the 1970's and 1980's, as tourism grew in natural areas, trails took on a new role: they connect places to promote economic gains (Maganhotto et al. 2009).

The beauty and diversity of natural and cultural resources are factors that have stimulated the implementation of trails for visitation (Lechner 2006). However, it is important that the efforts to maintain trails (or even open new ones) should be done by planning based on scientific criteria that can include environmental, social and cultural aspects.

Planning trails or areas for tourists, including outlooks or belvederes or observation decks, in natural spaces require constant landscape analysis that

can indicate the best areas for tourism, considering the visitor's welfare as well as protecting the environment (Costa 2008; Dumont et al. 2005) as well as the possibilities to manage trails based on user's preferences and conservation purposes. Lechner (2006) has identified the following factors for consideration when planning trails in natural areas: safety for hikers, presence of rare and endangered species, fragile areas, slope, possibility of flooding and land ownership. In order to reach environmental and social objectives, Neiman et al. (2009) mention the importance of strategies that make it possible to entertain tourists, or educate them, by means of signs or other interpretive resources.

During the initial phase of planning, methods would need investment in field research, assessments with interviewees and hiring experts to indicate the best routes, areas and places for tourism in protected areas. However, it is not usual for managers to have in the initial phase of planning enough resources for *on-site* interviews, or even to hire experts that know the main touristic attractions in the area. Moreover, expert studies that focused on specific topics may lead to a fragmented analysis, not considering the landscape as a whole.

The number of variables included in the planning phase of interpretive trails, the volume of information produced and its multiple interconnections lead to uncertainties and ambiguities resulting in more complex decision making. This is why there have been efforts to develop techniques and procedures together with the use of geoprocessing to carry out implementation and modification projects for trails, belvederes or outlooks and spots with high touristic potential (Vale et al. 2008).

Building models and simulations in the planning phase is an important step for understanding the set of data involved in understanding the landscape, and therefore become the bases for an environmental analysis (Borges 2011). This chapter presents a scientific contribution to nature tourism by using a viewshed methodology based on geoprocessing, which allows including the landscape into organization and territorial planning, using *Chapada dos Veadeiros* National Park and surrounding areas as a case study.

METHODOLOGY

Study Area

The *Chapada dos Veadeiros* National Park (PNCV) is located in the northeast of Goiás state, between Alto Paraíso de Goiás, Cavalcante and Colinas do Sul municipalities as shown in Figure 1.

The Park protects a Brazilian tropical savanna (Cerrado) with an area of 65,514 hectares containing a diverse vegetation formation, many water bodies and springs and rock formations that have formed in ancient times. PNCV is considered the largest environmental conservation area in Goiás and it is also an important touristic attraction (Lacerda 2008). The waterfalls called *Salto do Rio Preto*, *Carioquinhas* and *Canions* are among the main touristic attractions of the Park. The research area includes the most visited trails in PNCV and its surroundings (Figure 2).

Viewshed Model

One of the most efficient techniques for mapping the area visible of a region from another location with GIS software is called viewshed analysis (Figure 3). Viewshed analysis can be represented by a binary logic expressing the visual relationship between an observer and the object to be observed (or a natural attraction). Considering an observer located in a specific spot, the areas considered visible for him/her are recorded as value 1, whereas those areas outside his/her viewshed will be value 0. Besides this application, the reverse logic of this model can be also applied considering the same principle, i.e., the model can map, aside from the visible areas to an observer the areas where they can visualize some previously determined target. Viewshed use applications have been described in Fisher (1996).

Figure 3 depicts two representations of viewshed applications. The upper part represents the traditional technique showing the areas that can be seen by observer A (P1 and P4). The lower part represents the reverse

viewshed, where from a natural attraction one can see visible regions (Observer C, P6 and P7) or outside the visual reach (Observer B and P8).

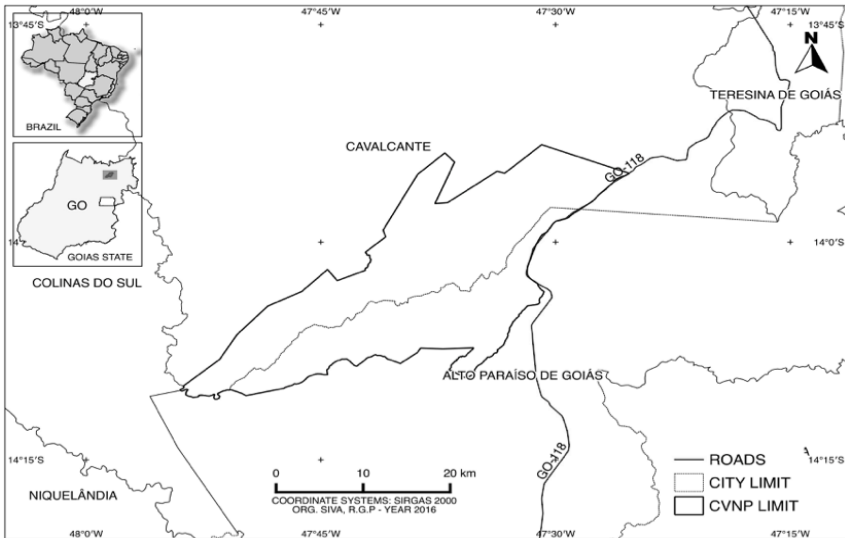


Figure 1. Location of PNCV. Organizer: SILVA, R.G.P.

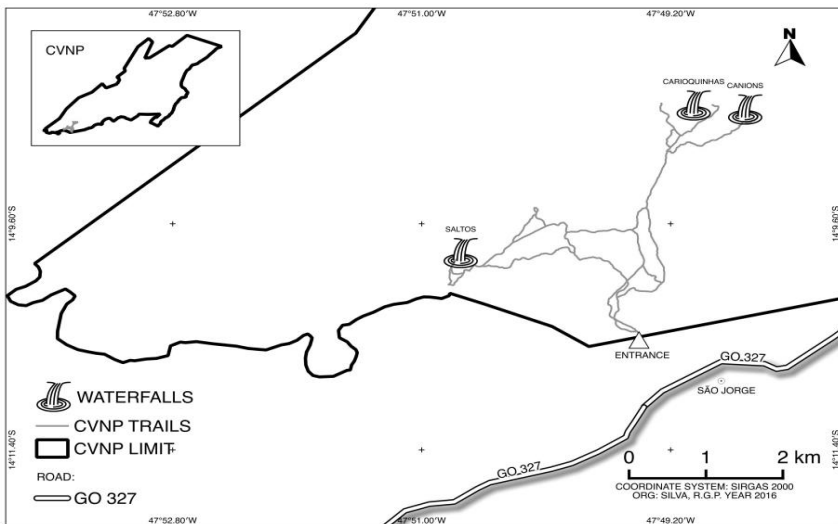


Figure 2. Trails and touristic attractions in PNCV. Organizer: Silva, R.G.P.

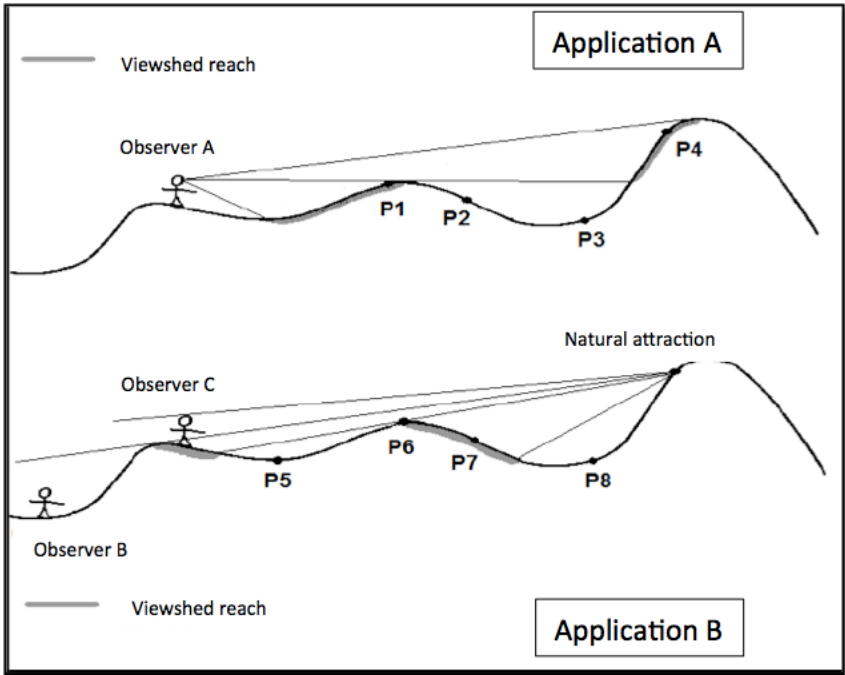


Figure 3. Space representation of viewshed as a concept. Author: Saito, C. H.

Existing procedures for executing this type of model are based on Digital Elevation Model (DEM). Here we have used a data set from the Shuttle Radar Topography Mission (SRTM) sampled at 3 arc-seconds and refined to 1 arc-second by means of kriging in the whole Brazilian territory as mentioned in Valeriano and Rossetti (2012). In this case, the spatial resolution was 30 meters. It should be noted the DEM includes the slope and an extract of vegetation, which makes it possible to build more accurate models.

Besides DEM, a 20 km maximum reach for visibility was used. In practice, visibility is conditioned by the presence of different-sized suspended particles, which leads to a seasonal variation of the visible light transmittance, especially in the low troposphere. Additionally, this visibility reach does not require sophisticated computational algorithms to deal with earth's curvature. The value chosen herein is 20 km and represents a typical value, for maximum visibility, which occurs for the months in which the

Park receives more visitation (June to September). A summary of how this value was derived can be found in Middleton (1957). The definition of the height for observation varies according to the application, and this data is needed for model execution.

The research used two forms of application of the model in order to investigate its potential for tourism planning. There should be criteria considering the feasibility of allocating new trails, belvederes and places for visitation. Aside from the models created inside our offices, we went to the field to validate data with photos. The photos depict the perspective of observers A and C in figure 3.

RESULTS

Application 1 – Model from the Observer’s Viewpoint

The analysis performed from the observer’s viewpoint was beyond identifying visible areas in a given point in a trail, i.e., mapping a visual field and analyzing what can or cannot be seen. After we included in the analysis several viewpoints of an observer along a trail, several overlaps were made for viewshed models in order to identify areas with less degree of redundancy among them (Figure 4). These places have been defined as strategic. In other words, they were considered the best places for enjoying nature, resting and promoting educational and interpretive activities.

The analysis was based on the Systematic Conservation Planning (SCP) assumptions (Margules and Pressey 2000). SCP seeks for an efficient model that can identify areas for conserving nature through the indication of the level of (ir)replaceability, representativeness, complementarity and flexibility (Margules and Pressey 2000). The principle of efficiency can be translated as the lowest cost to establish an area for conservation. The most effective system of areas prone to conservation can be defined by a set of technical knowledge about ecosystems, species and ecological processes.

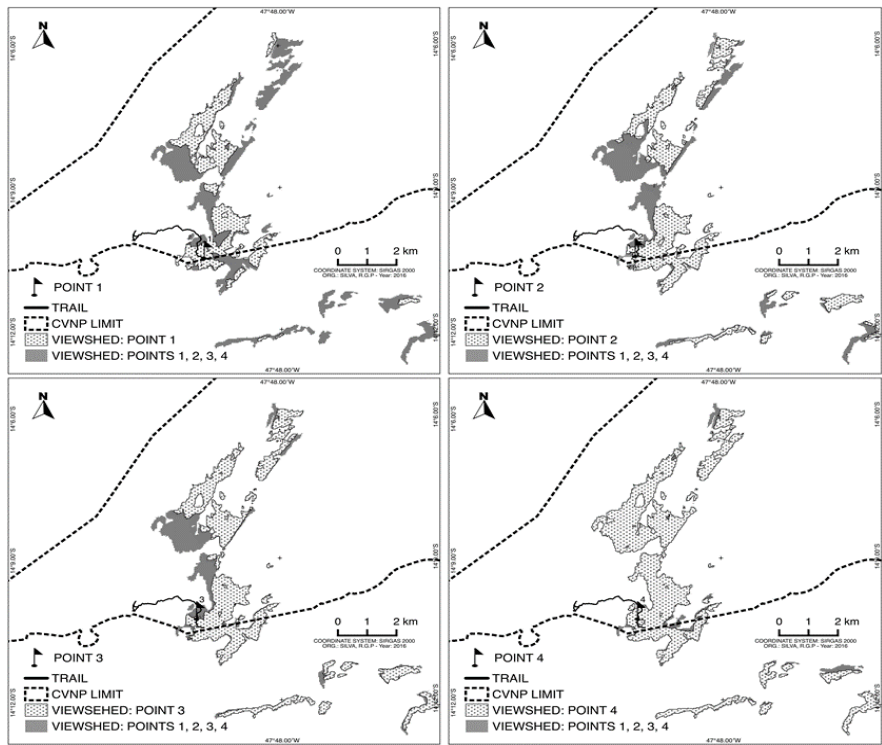


Figure 4. Analysis of the first four viewshed points with high degree of redundancy. Organizer: Silva, R.G.P.

The application of the same principles in the viewshed analysis necessarily used the quantitative criteria described by Tévar Sanz (1996), who worked with the concept of absolute visible area. Hence, when we established a sequence of viewshed models for observation spots we noticed the degree of redundancy was high among the models (Figure 4).

The most efficient system for identifying observation spots in a trail was the one in which the sum of visual fields was the least redundant and that was the closest to the absolute visible area. The idea of optimization lead us to select a restricted set of four points from which it is possible to visualize 57% of what would be seen from all the 17 points analyzed.

The definition of this set of points was done after a field protocol in order to validate the results of the viewshed modeling. The number of points for field validation corresponded to the maximum amount of points that a

person could cover by taking panoramic photos during the whole day. These were considered as the observation points of the created models.

The points chosen in the most efficient system are represented by numbers 3, 10, 16 and 17 (Figure 4), which show a redundancy of 9.21% among them. The results have shown that almost 60% of the landscape can be seen from the 4 points out of 17 analyzed. This means that in 4 points only, the tourists can see more than half of the possible natural attractions.

It should also be noted these four points of observation represent only 23% of the points under analysis. In practice, it is more feasible to propose to managers an area with natural attractions for managing few points and with better visibility and possibility of appreciation.

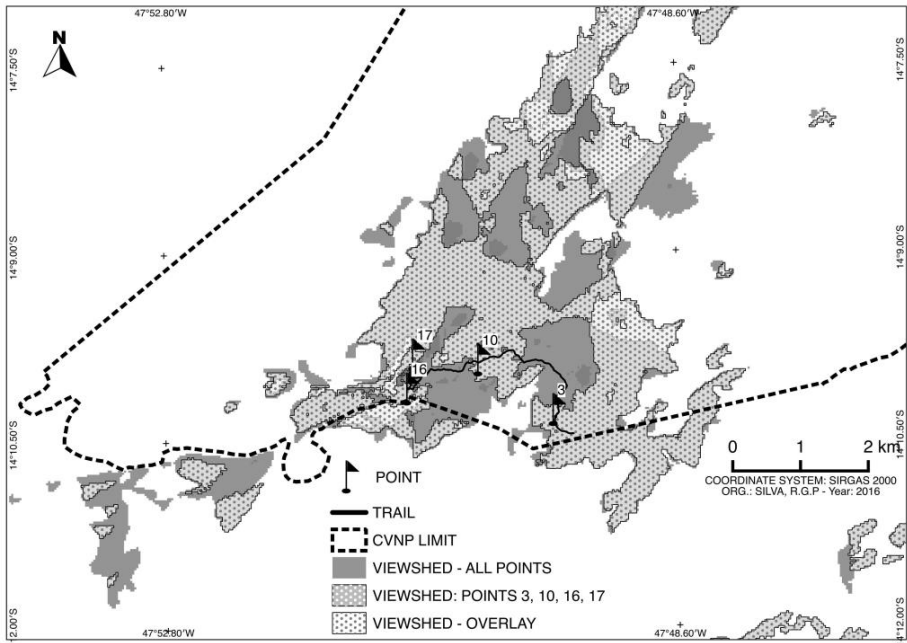


Figure 5. Contribution for optimizing the visual field along the trail. Organizer: Silva, R.G.P.

Although it is not a very high value (60%), what matters is that these point areas cover different parts of the Park and surroundings. This means

several attractions were included such as waterfalls, attractive landscapes and slope in evidence (Figure 6).



Figure 6. Photos that depict the visual field model from points: 3, 10, 16 and 17.
Author: Silva R.G.P. (2013).

The four points were selected because they have high representativeness (high complementarity), low redundancy and high irreplaceability, leading to the main scenic attraction: Saltos Waterfall. The darker shade areas (Figure 5) in the back indicate the resulting visual field for all 17 viewshed models.

For this research, points 3, 10, 16 and 17 were defined for the actual application and served as examples for geospatial analysis. However, the representation of the points can be changed with others that have high redundancy, depending upon Park managers' discretion. Flexibility is key when choosing viewsheds according to environmental interests because it aids planners, managers and decision-makers since they allow exploring different scenarios (Pressey 1999).

Application 2 – Model from the Attraction's Viewpoint: Reverse Viewshed

In order to define the best areas with visual potential to the major natural attractions of the Park, the selected procedure was the reverse viewshed, a reverse application for the traditional model. Hence, starting from attractions that have a greater touristic appeal, we can establish a set of places (points) from where they can be seen, so new trails can be implemented or become priority for installing belvederes.

Applying the reverse technique required new viewing angles along the major scenic attractions - *Carioquinhas* and *Saltos* Waterfalls (Figure 7). After embedding the raster base of viewing angles, we performed the reverse viewshed analysis, considering the height of the observer as 1,70 meters.

In Figure 8, the lighter gray shaded areas bring a total area of 245 hectares with visibility from Saltos Waterfall and in the darker shaded areas we have 431 hectares with visual reach from the *Carioquinhas* Waterfall. According to the results of this model, it is possible to identify areas to locate new trails, what can grant tourists the visual contact with these natural attractions.



Figure 7. *Carioquinhas* Waterfall (left) and *Saltos* Waterfall (right); Author: Silva, R.G.P. (2013).

In this study, it is important to point out that in spite of the fact that these areas are contiguous (closer), this does not ensure effectiveness when implementing a long-range trail that can go through all these areas. The

uneven slope and the well conserved vegetation not only increase the scenic value and biodiversity, but they also bring difficulties to the structural aspects (infrastructure) of implementing and maintaining trails.

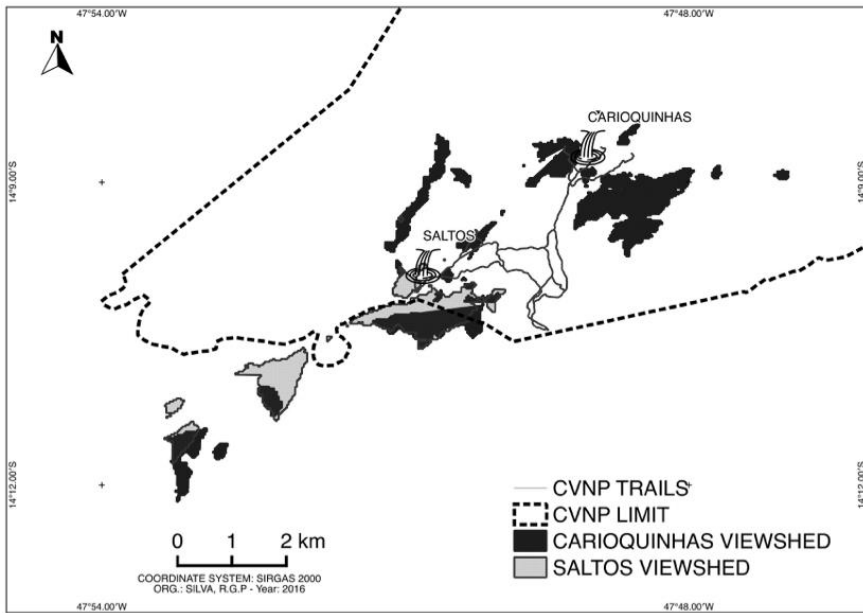


Figure 8. Representation of reverse viewshed areas. Organizer: Silva, R.G.P.

In areas that are steeper and very uneven, there are canyons and rivers with rapids that make it impossible to connect the areas. Moreover, one should note the difficulty of installing equipment that can bear the impact of tourists, since these are areas that require more maintenance and installation of information signs and safety equipment (cables, railings, support, etc.)

Visibility, biodiversity and scenic beauty should not be considered exclusive conditions for opening new trails, but it should be one more element that can aid planning. Small extensions of trails or observation towers in these areas will probably meet the demand for new options of tourism.

Figure 9 shows (in the darker shaded areas) that considering the whole area in which it is possible to see scenic attractions, 42% of them are outside the Park and thus we have 58% (the light shaded areas) of them are inside the Park. These results address the importance of planning of buffer zones from the tourism perspective. Including the Park, surrounding areas may contribute for conservation since there may be a reduction in the number of tourists inside the protected area because they may visit places outside the park. This is a way of diversifying trail options and addressing other sectors (farms and local properties) when managing tourism. This reinforces the possibility of planning and managing tourism not only focused inside the limits of the Park but outside the park as well. When planning of tourism includes the surrounding areas, it can disperse and avoid concentration of the touristic flow from the Park entrance straight to the waterfalls.

Considering the model has indicated areas outside Chapada dos Veadeiros National Park, which also have scenic attractions, the areas corresponding to the viewshed intersection sum to 13% of the whole visible area (Figure 10). These intersection areas can be classified as single spaces in relation to the attributes of uniqueness, rarity, exceptionality, beauty, large visual width (panoramic landscape) (Pires 2005; Tévar Sanz 1996). So, although they represent a small portion of the geographical space, such areas have high scenic potential, with great feasibility for installing belvederes, informative signs and other infrastructure for tourists.

Due to the short distances between these single spaces and the Park roads, we set up trails that could connect these areas. So, the research also included field work to verify existing trails in the viewshed intersections as single spaces. During the field activity, we were able to validate the existence of these trails, thus also validating the model. At the same time, we could describe alternative trails, rarely known, which can be included in the tourism planning for the areas close to the PNCV.

Figure 11 shows photos assessments done in a few of these single spaces. They already contain belvederes, but with no infrastructure or information at their location. From this analysis, there could be potential mechanisms to make those trails and belvederes more visited.

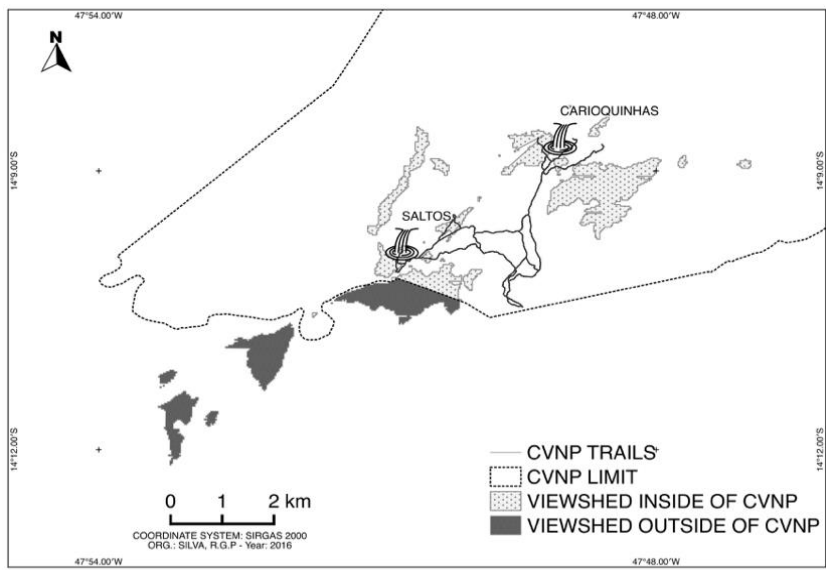


Figure 9. Analysis of reverse viewshed areas – inside and outside the PNCV.
Organizer: Silva, R.G.P.

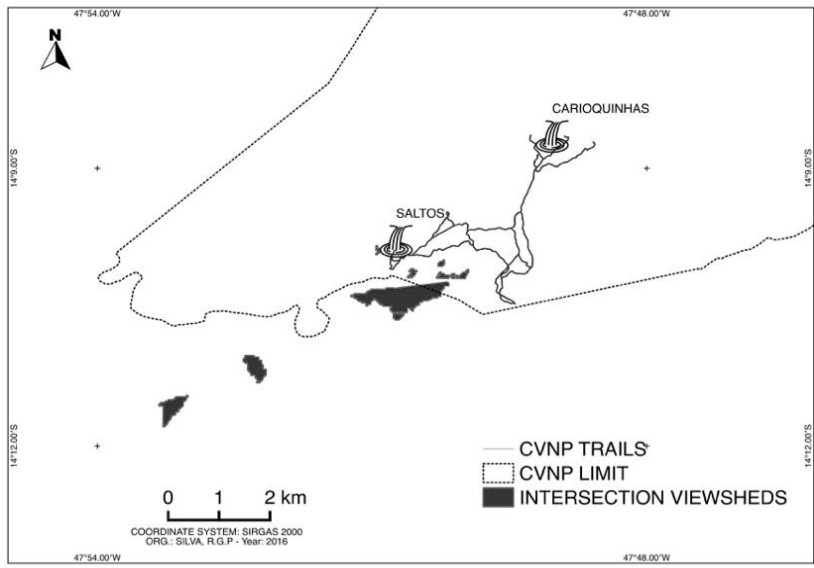


Figure 10. Analysis of intersection viewsheds – Single spaces. Organizer: Silva, R.G.P.



Figure 11. Photo assessment of single spaces. Author: Silva, R.G.P (2013).

CONCLUSION

Landscape analysis conducted through viewshed modeling using GIS is an alternative for generating information on the potential visibility of the landscape, as well as on the determination of priority areas that can maximize tourism based on the appreciation of certain natural attractions. Such characteristics make it possible to embed new spaces for developing tourism in natural areas. It also can be part of a decision-making support system, thus reducing the subjectivity in the assessments of visual impacts for environmental licensing.

Using geoprocessing to support the analysis of environmental variables was shown to be essential for elaborating an integrated study. Thus, viewshed modeling is useful due to easy execution, the availability of many software programs and the ability to use a reduced number of input variables.

Photo assessments that were used to validate the modeling have confirmed the compatibility of scale and spatial resolution of the variables in the field application. Thus, the validation grants credibility to the model studied, turning it into a planning tool with precision and scientific basis.

Although the use of viewshed models is still just beginning for tourism planning, the contribution herein involves not only the dissemination of the method itself. It also is a contribution to the understanding of the model once its results can be used for planning in response to the demand for nature tourism and protected areas managers.

In the specific case of Chapada dos Veadeiros National Park, the results obtained in the different applications may serve to guide trail design and interpretation as a whole and not only in the waterfalls located at the end of the trail. Moreover, it helps identifying strategic spots that can be targeted for future installations of information panels or observation towers, as well as open many possibilities of exploring tourism in other areas of the Park.

The research gains more importance when it is discussed among scholars and managers aiming at a more integrated approach for conserving natural resources and sustainable tourism. More important than defining areas with touristic potential is the potential of identification of new trails with greater visual width. This can allow tourists to have a more enjoyable view of the landscapes, what leads to more satisfaction.

Moreover, the flexibility of the model entails other discussions, either related to management, decision-making, budget or even educating the tourist when choosing certain areas with potential for new trails or visualization spots. Hence, this study opens a pathway to new research and approaches that can deal with the importance of strategic, technical and scientific planning of visitation trails in natural areas.

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Chapter 8

**VISITOR USE PLANNING AT
MARIQUINHA WATERFALL, CAMPOS
GERAIS NATIONAL PARK, BRAZIL**

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ABSTRACT

The objective of this chapter is to discuss the visitor use profile and quality levels of visitors to Mariquinha Waterfall, in the National Park of Campos Gerais (Brazil) and demonstrate the importance of using data to

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make land and people resource decisions. The park was created to protect the remaining Araucária moist forests and grasslands of Campos Gerais, located in the Brazilian state of Paraná. The research was conducted using a face-to-face survey instrument, using electronic tablets. Results showed that the visitors were primarily local family and friends groups, seeking a natural recreation experience. The chapter also demonstrates the importance of using data in decision-making.

Keywords: Brazilian protected area; visitor satisfaction; visitor monitoring; data for decision-making

INTRODUCTION

One of the goals of the Chico Mendes Institute for Biodiversity Conservation (ICMBio), the Brazilian federal agency charged with the management of its federal parks and protected areas, is to connect people to Brazil's amazing resources. Simultaneously, it is to protect the natural resources and ensure they are used appropriately (ICMBio 2017).

This will be a true challenge for ICMBio managers. Even with ecotourism growing in popularity, Brazilian protected areas are not seen as a typical destination for most Brazilians, but are often seen as “isolated islands far from social and economic reality” (Pimentel and Magro 2011, 93). This is contrary to the conservation managers' vision of public use that suggests protected areas should be an agent that brings society closer to nature, raise awareness about the benefits of nature, and to bring more meaning to protected areas (Burns and Moreira 2013). The greatest challenge for researchers and managers in protected areas is how to provide for the protection of natural resources while at the same time maintaining the quality of the visitor experience (Kataoka 2004).

This chapter uses a case study approach to demonstrate how research was used to aid managers in the data collection of visitor monitoring and quality evaluation. In addition, this chapter describes the profile of visitors to Mariquinha Waterfall, a primary attraction of the Campos Gerais National Park. Mariquinha Waterfall was chosen for several reasons: a) the

high numbers of visitors to the site, b) the existing tourism infrastructure (facilities, services and information), c) little or no research about the area, d) intensive use at the last years and e) because of the potential for environmental degradation of the area.

Brazilian Protected Areas

The creation of protected areas within Brazil was one of the most important decisions made by the government in support of the conservation of biodiversity (Ministério do Meio Ambiente 2007). In addition to the potential economic impact within undeveloped regions, a federally protected area can contribute to the protection of a region's natural resources.

Andre Rebouças, an engineer who was inspired by the creation of Yellowstone National Park in the United States, set out to create the first Brazilian federal park. In 1937, Brazil's first national park, Itatiaia National Park, was created from a former Biological Station in Rio de Janeiro State. In 1939, the National Parks of Iguaçu and Serra dos Órgãos were established, followed by the National Forest of Araripe-Apodi (1946) in the state of Ceará (Takahashi 1998).

Prioritizing conservation, preservation and the protection of the traditional way of life, the legislation of the 'National System of the Protected Areas' (SNUC) was created in the year 2000. This public policy organizes the Brazilian protected areas in categories with specific objectives and levels of use. This system is considered one of the most sophisticated in the world; its conception goes beyond maintaining biodiversity, allowing for various uses of lands and natural resources. (Ministério do Meio Ambiente 2011).

The Chico Mendes Institute for Biodiversity Conservation is the federal agency responsible for the 326 protected areas (CNUC 2016), located in all of the Brazilian biomes. There are presently 72 National Parks, 23 of which are in the Atlantic Forest region (Table 1).

Table 1. Brazilian Federal Protected Areas Categorized by Management and Biome

	Atlantic Forest	Tropical Savanna	Caatinga	Pampa	Pantanal	Amazon	Marine	Total	Area (ha)
Ecological Station	4	5	4	0	1	10	8	32	7.471.660
Natural Monument	1	0	1	0	0	0	1	3	44.300
National Park	23	13	7	0	1	19	9	72	25.506.556
Wildlife Refuge	4	1	0	0	0	1	2	8	269.177
Biological Reserve	15	1	1	0	0	10	4	31	4.283.039
Strictly Protected	47	20	13	0	2	40	24	146	37.574.732
National Forest	21	6	6	0	0	34	0	67	17.684.818
Extractive Reserve	1	5	0	0	0	35	21	62	12.432.400
RDS*	0	1	0	0	0	1	0	2	102.577
Environmental Protected Area	5	9	3	1	0	3	12	33	10.530.084
ARIE**	6	1	2	1	0	3	3	16	44.800
Sustainable Use	33	22	11	2	0	76	36	180	40.417.679
Total	80	42	24	2	2	116	60	326	77.992.411

Source: CNUC (2016).

* RDS = Sustainable Development Reserve.

** ARIE = Area of Relevant Ecological Interest.

The SNUC brings together various types of protected areas under one law, and authorizes the management of Brazilian protected areas, where all of the categories have the same importance and complement conservation goals (Oliveira 2012).

Visitor Profile and Measuring Quality in Protected Areas

Tourism is currently considered one of the largest industries in the world, with increasing numbers in most places worldwide. Ecotourism, according to the World Tourism Organization (WTO), has shown three times more growth than the rest of the tourism sector (Fundação Florestal 2010). Considering that some of the most beautiful Brazilian landscapes are protected areas, the trend is to increase the flow of visitors into these areas (Nelson 2012).

Data collected from Brazilian federal parks show a 330% increase in the number of visitors between the years 2006 and 2013 (ICMBio 2014), far surpassing expectations. This increase in visitor numbers, and in the growth estimate for the ecotourism industry, justifies the need for public use plans that help manage those visiting protected areas. This will hopefully bring about improvements in the quality of the visitor experience and minimize environmental impacts of tourism.

Understanding visitor use and peoples' expectations and satisfactions, is essential for the management of resources (Burns and Graefe 2005), and one primary goal of resource managers is to maximize the satisfaction of the visitor while minimizing the impact to the environment. Collecting visitor use data can provide managers with not only satisfaction indicators, but changes in visitor profiles and visitor expectations over time. Once the resource manager has a database that adequately represents use in a specific area, the resource manager can begin to achieve the goal of developing better experiences and opportunities for existing and potential visitors (Kataoka 2004).

Although visitor perceptions are important, resource managers must balance the need to meet visitor expectations with the primary objective of

biodiversity conservation within the protected areas. Nonetheless, managers should seek to obtain as much data as possible so they can decide what management actions should take place at what specific areas and at what specific times. The spatial and temporal nature of outdoor recreation use in parks and protected areas requires a keen understanding of visitor use—and resource managers cannot and should not make decisions without having data to support their decisions (Takahashi 1998; 1987).

The conceptual framework expressed in this chapter is that of understanding the role of social aspects in a reality where the physical and biological aspects have historically been given more credence. We strive to understand the quality of visitors' experiences so that managers can use this information to add the voice of visitors to that of the various biologists and other scientists.

Campos Gerais National Park

The Campos Gerais National Park was created in the 2006, and is located in the central east region of the State of Paraná in the south of Brazil (Figure 1) and consists approximately of 21,000 hectares.

Oliveira (2012) states that the geological composition was the fundamental factor that led to the creation of the National Park and the manner in which it was created. The Campos Gerais National Park lies within the larger Campos Gerais region—a region with special geodiversity and geological heritage. This includes Devonian fossils of marine invertebrates, several stratotypes of the Paraná Basin and an excellent record of Permo-Carboniferous glaciation of the Gondwana supercontinent. It also boasts a spectacular geomorphological heritage: canyons connected to a swarm of Cretaceous diabase dykes, related to the South Atlantic Ocean opening; escarpments up to hundreds of meters of elevation and waterfalls; and a karst landscape of world relevance focusing on siliciclastic rocks, with sinkholes, caves, underground rivers, among others (Moreira et al. 2011).

The history of visitors to the tourism attractions of the National Park of Campos Gerais is long standing. When the park was created, tourism

activities were already underway by the people from the region. The activities were coordinated by private land owners, and since the federal protected areas weren't yet established (except on paper) there was no commitment to environmental sustainability (Garcia, Moreira and Burns 2015).

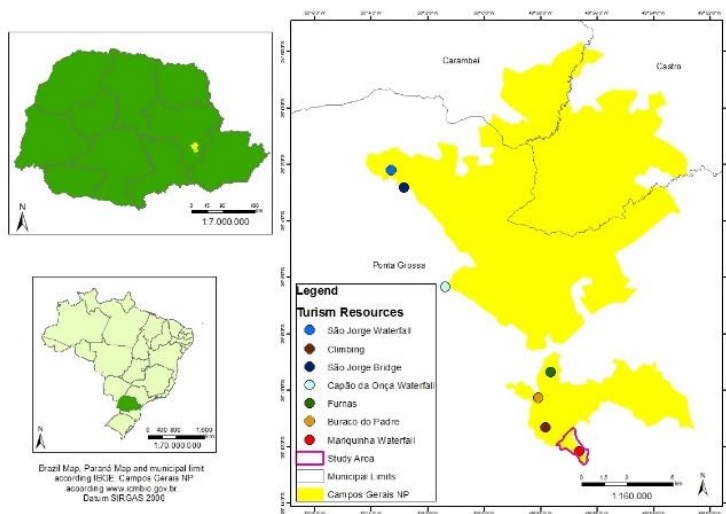


Figure 1. Campos Gerais National Park map, located in the central east region of the State of Paraná in the south of Brazil

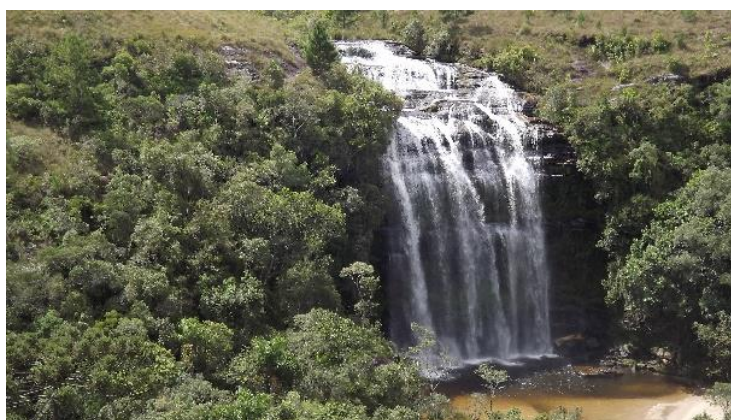


Figure 2. Mariquinha Waterfall

As noted, Mariquinha Waterfall was selected as a survey site based on its consistent high visitor use, potential for degradation of the environment, and many other reasons. Mariquinha Waterfall is one of the six primary attractions in the area where public use is already occurring on a consistent basis (Figure 2). In this area, there are activities like hiking, swimming, camping, outdoor grilling. (Garcia 2015).

METHODOLOGY

Survey Design

The survey instrument was designed by replicating and extending previous successful instruments measuring similar constructs (Burns, Graefe and Absher 2003; Niefer 2002; Soriano et al. 2013). The survey instrument was made up mostly of quantitative questions, with a few open-ended.

The answers from the following questions were examined.

1. What is your age?
2. What is your education level?
3. What is the city in which you reside?
4. Is this your first visit to the Mariquinha Waterfall?
5. How many people are in your group today?
6. Which of the following selections best describe the composition of the group?

To identify the quality of the experience, the following questions were analyzed:

1. Which activities did you participate in?
2. Which of the following were the primary reason for visiting this area?
3. In general, how would you evaluate your experience today?

4. In general, how would you rate the quality of each of these items on a scale of 1–5 to the following questions: cleanliness, protection, security, trail condition, infrastructure, and accessibility?

Sample Design and Data Processing

The survey participants were visitors at the Mariquinha Waterfall, older than 18 years of age and who voluntarily agreed to participate in the study. The survey was filled out using electronic computer tablets through the use of an app that is commercially available. A total of 118 surveys were conducted in 13 field trips between the dates of December 2013 and February 2015.

Respondents were asked about their satisfaction levels on several key quality domains regarding the recreation areas. These included cleanliness, protection and security, trail conditions, installations, and accessibility of the area. The respondents were shown a scale ranging from 1 (awful) to 5 (excellent), or they could indicate that the question did not apply (Burns and Graefe 2006a). Data were collected through the use of an e-tablet, using Droid Survey technology. Data were then uploaded to a data cloud and provided back to the authors following analysis using the Statistical Package for the Social Sciences. The authors then analyzed the data, choosing data analysis that would facilitate ease of use for decision-making by resource managers. The data were then segmented into three management categories: activity participation, visitor profile, and quality indicators.

RESULTS AND DISCUSSION

Visitor Profile at the Mariquinha Waterfall

Visitors to Mariquinha Waterfall were relatively young (Figure 3), typically ranging between the ages of 18—38 years. This finding is similar

to what is seen in previous studies in other Brazil protected areas, including Tijuca National Park and the State Park of Ilha Grande in related works by Malta and Costa (2009) and Araújo (2006), respectively.

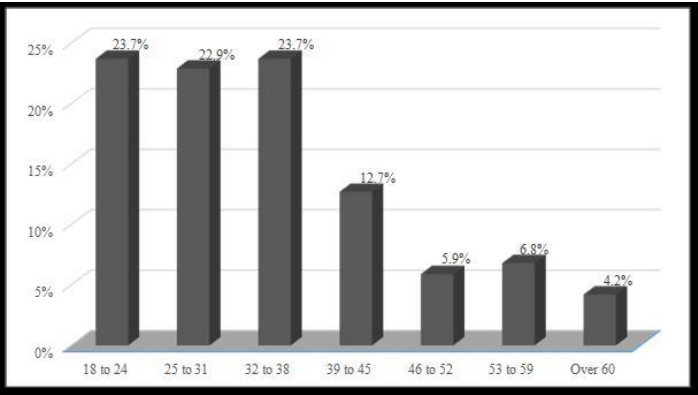


Figure 3. Age Demographic for the Mariquinha Waterfall

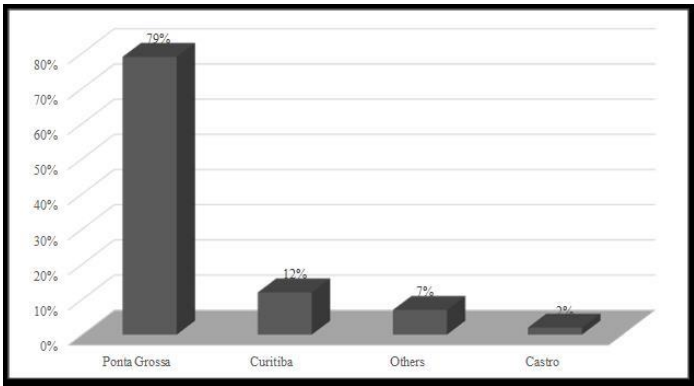


Figure 4. Visitor Origin

Over half of the respondents (53.8%) had graduated from high school, and one-third (33.3%) were still enrolled in high school. The vast majority of visitors (94%) originated in the state of Paraná, and most from the nearby city of Ponta Grossa (79%) (Figure 4). The data revealed that the vast majority of respondents were either in groups with family and friends or family only groups. These results are similar to what was seen in previous

studies at Ilha Anchieta State Park (Kataoka 2004), at Pico do Marumbi State Park (Takahashi 1998) and at Ilha Grande State Park, as noted by Araújo (2006).

Respondents were asked to select all of the activities they participated in, as many visitors participate in multiple activities. Most visitors were swimming and picnicking (Table 2), while a small percent were camping and rappelling in the rock formations.

In the late 1960s a paper entitled “The Average Camper Who Doesn’t Exist” was written (Shafer 1969). This is a short paper that is still sometimes discussed among resource managers today. In it, Shafer suggests that we cannot merely look at basic statistics and generalize about our recreationists. We must segment and parse out the data to the point where we understand our visitors.

Table 2. Activities at the site classified by group

Activities done by group (%)			
Activity	Family	Friends	Overall
Swimming	75.0	80.9	76.3
Picnic	28.6	44.7	30.3
Camping	2.4	4.3	3.4
Rappel	1.2	4.3	2.5

Table 3. Motivation for the visits to the Mariquinha Waterfall

Motivation for Visit	First Visit (%)	Repeat Visitors (%)	Overall (%)
Contact with Nature	72.9	46.7	57.5
Like the Location	12.5	46.5	28.3
Practice physical activity	6.2	6.9	5.7
Spend time with friends	8.3	8.6	7.5
Proximity to my home	-	1.7	0.9

The premise in the Shafer manuscript is pertinent to understanding motivations to visit the Mariquinha Waterfall, as expressed in Table 3. Overall about 58% of respondents said their primary motivation to visit was

to experience contact with nature. However, when first time visitors are compared with repeat visitors, there is a distinct difference. While almost three quarters (72.9%) of first time visitors said their motivation was to be in contact with nature, less than half (46.7%) of repeat visitors said the same. A closer examination shows that repeat visitors are equally as likely wanting to be in contact with nature as they are to visit because they like the location. This suggests that their desire to be in contact with nature leads them to like the location—which is a stated goal of management. ICMBio management desires to connect people with nature, and of course people cannot like a place until they visit. This small example shows not only the importance of understanding visitors, but also of understanding and using data to inform managers on decision-making.

Table 4. Visitor's opinions on the positive and negative aspects of the Mariquinha Waterfall

Visitor Opinion	Responses (%)
Most liked	
Waterfall	58.5
Nature	10.2
Landscape	9.3
Swimming	8.5
Others	8.5
Everything	5.1
Least Liked	
Nothing	47.5
Roads	13.6
Structure	7.6
Capacity	5.9
Behavior	5.9
Trail was too long	5.1
Trail Conditions	5.1
Others	5.1
Trash	4.2

In order to allow respondents to share their opinions in a more qualitative way, a few open-ended questions were asked. Highlighted in

Table 4 is a simple question that has proven to be invaluable to resource managers in other studies (Burns and Graefe 2006b)—what did you like most/least at Mariquinha Waterfall on this trip? A majority (58.5%) of respondents said it was the waterfall itself that they liked most, and about another one-fifth said nature/landscape.

For resource managers, this information is data that can be used to support requests for additional funding for infrastructure—poor roads in this case. And while just a small proportion of respondents suggested poor behavior as something they disliked, it is indeed unusual to see poor behavior mentioned by visitors. This may indicate there may be a problem that managers may need to be aware of. And, if managers find a problem, this information is data that can be used to explain why specific management actions may be implemented, such as new regulations limiting specific behavior (Burns and Graefe 2006a).

Visitor Monitoring at the Mariquinha Waterfall

There is a large and long-running body of research focusing on visitor monitoring, and its benefits to both managers and, ultimately, visitors (Burns and Graefe 2005). Within this larger context, many researchers have suggested there is both a “spatial and temporal” context to recreation use (Manning et al. 1998). The Mariquinha Waterfall setting experiences this fluctuation in visitation, primarily because of weather and holiday seasons.

The data indicate that there is a seasonal trend to the visitation activities, which may highlight a potential economic problem for the area. Facilities and services may be planned for a high public demand during the high seasons, then may not be sustainable during low tourism months. Accordingly, it is important for the planning and implementation of new types of tourism products (e.g., hiking, rappelling) that may increase visitor use in the months where the temperature is not ideal for sitting near a waterfall or for swimming.

As Figure 5 shows, there is a larger concentration of visitors at the research area between the months of December through January.

Specifically, Mariquinha Waterfall received just over 6,000 visitors during this timeframe, compared to just under 2,000 during the rest of the year.

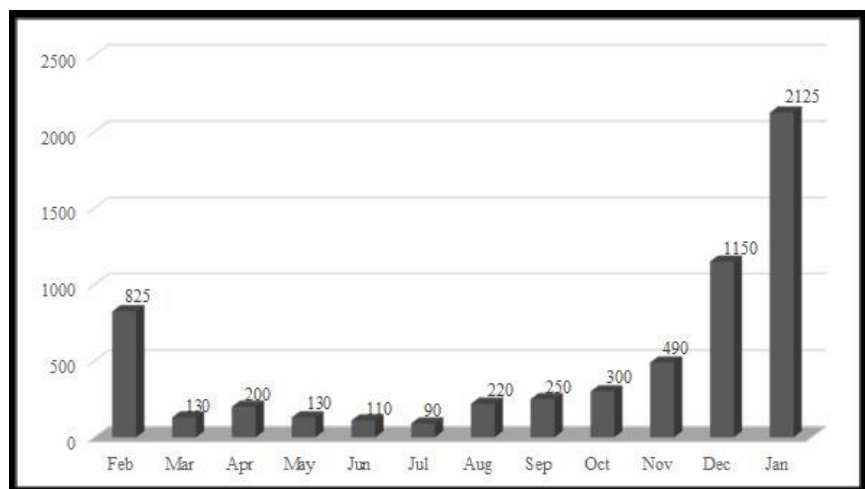


Figure 5. Visitor Counts per month, between February 2014 and January 2015

Visitor Satisfaction with Infrastructure and Services

A final indicator was that of visitor satisfaction. Replicating the Burns, Graefe and Absher (2003) study, a single-item indicator (where 1 is not at all satisfied and 6 is a perfect trip) of overall trip experience was used. Overall, the visitors to the Mariquinha Waterfall were extremely satisfied with their visit. (Figure 6), with the negative responses summed to less than 1%.

To further expand on visitors' satisfaction with specific items, we examined the following items, cleanliness, safety and security, trail conditions, installations, bathrooms, barbecue, showers, and accessibility (Burns and Graefe 2006a). As expected visitors were highly satisfied with some of the indicators, and less satisfied with others.

On a scale from 1 to 10, the highest level of satisfaction was for cleanliness of the area (6.9), followed by trail conditions (6.0) and

safety/security (5.7). The lowest ratings were noted for road access (4.3) and facilities (4.4).

It is interesting to note that the highest satisfaction levels were for indicators within control of the resource managers (trail conditions and safety/security). Conversely, the lowest satisfaction ratings were for items out of managers' control (facilities and road conditions).

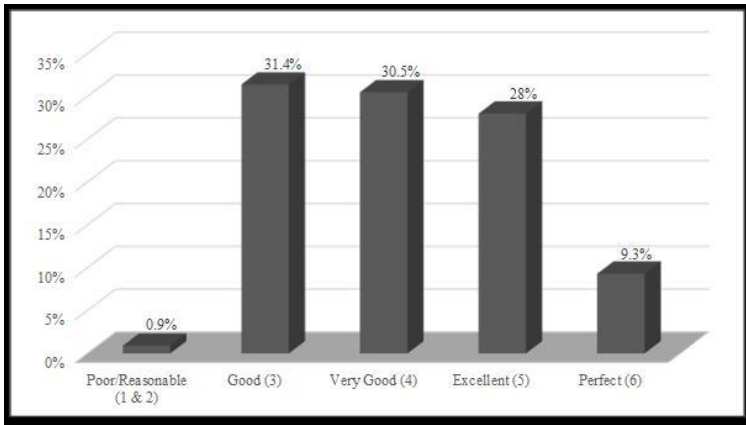


Figure 6. Visitor Satisfaction

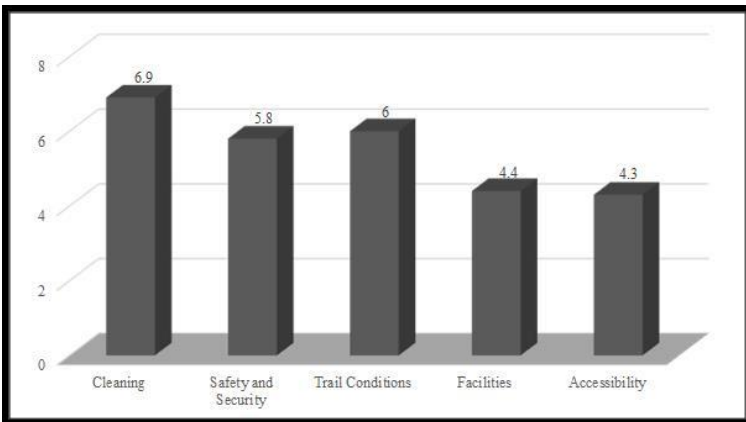


Figure 7. Visitor Evaluation of Infrastructure and Service

The sole access road is maintained by the local municipality, but is not maintained properly during the tourism season. The road is maintained for access to the surrounding agricultural field for planting and harvest access, typically in March and April of each year. These months are not part of the high tourist season so the roads are in need of service during the periods of high recreation use.

CONCLUSION AND IMPLICATIONS

The purpose of this chapter was to share with the reader the results of a visitor use study and its implications for use as data in resource management. The visitor profile showed that respondents were youngish, and visited in groups consisting primarily of friends and/or family.

A comparison of first time versus repeat users showed large differences in the motivations of the visitors. First time visitors were motivated to visit to be closer to nature, while repeat visitors were more likely to say they visited because they liked the location. Perhaps this is a result of the visitors truly appreciating the nature they experienced as first time visitors—and returning with a greater appreciation for the place. One of the goals of ICMBio is to connect people with nature—and the data seem to show this has been successful, at least at this one specific site. Changes are being made in partnership with the local owner.

The quality of the visitors' experience was analyzed and expressed in two broad categories: overall experience and satisfaction with specific quality service items (e.g., road access, cleanliness). Visitors were relatively satisfied with their experience, but not overwhelmingly so. There is a vast body of literature focusing on service quality in outdoor recreation settings, and most results show a higher level of satisfaction. There are many reasons why satisfaction levels at Mariquinha Waterfall may be lower than in other settings. These include the fact that the Mariquinha Waterfall is in transition from a private owner to an ICMBio protected area, behavior by visitors that is inappropriate for national park settings, and extremely low numbers of ICMBio field personnel and funding for recreation management.

Using this study as baseline data, there are some management actions that can be used to minimize the things that decrease the quality of the experience.

- a) Develop and market alternative recreation activities in the study area such as camping, rappelling, etc. This action may allow for a more consistent flow of visitors to the site.
- b) Develop an interpretive trail on the “Trilha Campo,” one of the trails that goes to the waterfall. There will be more information on biodiversity and geology that will highlight the need to protect and conserve natural resources.

Finally, resource managers should take advantage of the baseline data and use it in multiple ways. Managers can use the data to make day-to-day decisions about the Mariquinha Waterfall setting; the data can be benchmarked with other natural resource settings; and the methods used can be replicated and extended elsewhere in ICMBio protected area.

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Chapter 9

**DEMONSTRATION SITES: A PRACTICAL AND
POWERFUL TOOL FOR EVALUATING
OPTIONS, DEVELOPING BEST PRACTICES,
AND BUILDING CAPACITY IN
PROTECTED AREAS**

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ABSTRACT

Protected area managers use “demonstration sites” as a tool to test and develop innovative and effective methods for managing public use in

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protected areas. In 2012, Brazil's Chico Mendes Institute for Biodiversity Conservation (ICMBio) initiated a Public Use Demonstration Site Program with partners US Agency for International Development, the US Forest Service, Colorado State University, West Virginia University, and the University of Montana. The Tapajós National Forest in Pará State was selected as the system's first Demonstration Site with the goal of demonstrating how to plan, develop, implement, and monitor a comprehensive and integrated public use program. The Forest is comprised of 530,000 hectares of Amazon tropical rainforest biome and is located at the confluence of the Tapajós and Amazon Rivers, near the city of Santarém and the popular tourist destination of Alter do Chão. With established and growing regional, national, and international visitation to the Forest, the Tapajós is an ideal choice for a demonstration site focusing on public use and tourism. Demonstration sites are a practical and powerful tool for helping to create a culture of learning in an organization. This chapter explores the suite of projects completed at the Tapajós Demonstration Site, their outcomes, and lessons learned, both on-site and for ICMBio system-wide. The projects adapted broadly accepted best practices, tools, and methods to reflect the Brazilian context, needs, and goals. These projects also built on system-wide training seminars, highlighting the direct application of concepts and techniques learned and providing mentoring during project implementation. Finally, they demonstrate the importance of public use and tourism to help connect Brazilians and visitors to the country's amazing system of protected areas.

Keywords: capacity development, capacity building, training, environmental interpretation, best practices, demonstration sites, Amazon, protected areas

INTRODUCTION

Developing a Culture of Learning

Developing an organizational culture that values learning and adaptive management is critical for an agency's survival and ability to meet its legislative intent. Land management agencies are no exception. Natural resource and public use management in protected areas must adapt as a

society's needs, desires, and expectations of its public lands evolves. Those agencies and systems that have institutionalized mechanisms to face, explore, and address these changes have a higher chance of fulfilling their missions and remaining relevant to society for the long-term.

Building an institutional learning culture enables the institution to also prioritize individual and institutional capacity development. Capacity development has been defined by the United Nations Development Program as, "the ability of individuals, organizations, and societies to perform functions, solve problems, and set and achieve objectives in a sustainable manner." Capacity development is often times viewed as synonymous with training; however, capacity development is much broader and includes a variety of tools and techniques including training, coaching and mentoring, experiential learning, partnerships and networks, communication, and leadership development, to name a few. Learning is the foundation of all of these capacity development techniques. All of the learning formats provide important contributions to capacity. For example, formal training courses not only provide tangible opportunities for new knowledge acquisition, but also the opportunity for intangible benefits such as building confidence and creating a community of practice with the other trainees. What is often missing with capacity development formats is a safe space and the institutional green light to actually test out or put into practice the new capacity acquired. Demonstration sites provide a unique platform to empower individuals and institutions to try out new things; they are one of the most tangible expressions of an institutional learning culture.

In Figure 1 we demonstrate a conceptual Theory of Change (ToC) outcomes framework that has helped guide the development and implementation of capacity development in interpretation with the Chico Mendes Institute for Biodiversity Conservation (ICMBio) in Brazil. As defined by the Center for Theory of Change, ToC is a "comprehensive description and illustration of how and why a desired change is expected to happen in a particular context." In capacity development we engage in a series of activities and have an expected outcome or impact in mind that will result because of the capacity development intervention. A ToC outcomes

framework provides us with a planning and visioning tool that enables us to identify what our long-term goals are (outcomes/impacts) and then work backwards to identify what must happen, in what order, for those goals to be achieved. In the case of the example represented in Figure 1, the goal of the project was to improve biodiversity conservation in protected areas in the Amazon Basin of Brazil. By working backwards we arrive at four specific activities that we felt would contribute towards the attainment of our long-term goal in the technical competency area of interpretation including: (1) interpretation technical skills training, (2) interpretation training of trainers and/or international certification training, (3) mentoring during replication training, and (4) implementation of interpretive products at the demonstration sites. The outcomes framework can be replicated for other technical competency areas as well to map out project interventions that contribute towards the same overall project goal. In this chapter we will be focusing in on one of these activities, demonstration sites, and their importance for achieving both site specific and system wide capacity development outcomes that contribute towards on-the-ground impact.

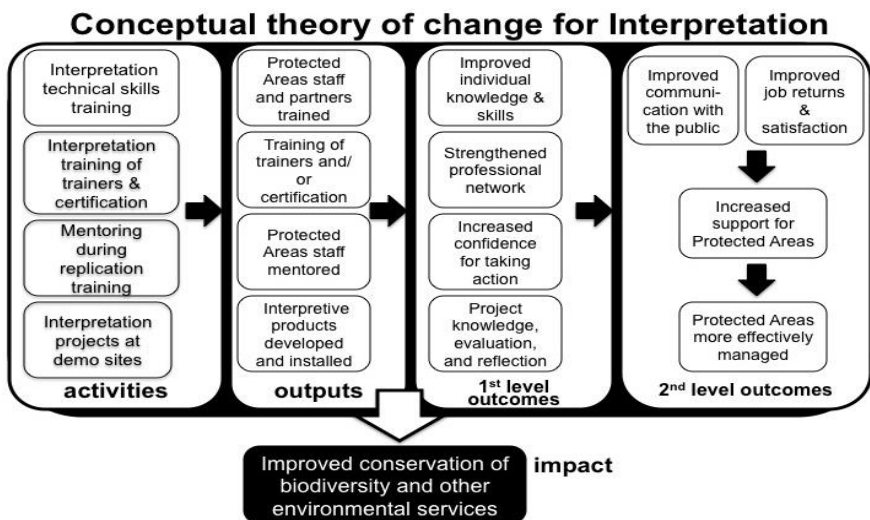


Figure 1. Conceptual theory of change outcomes framework for interpretation capacity development and resulting impact on biodiversity.

Demonstration Sites and Protected Areas

Demonstration sites are learning platforms where projects, processes, and infrastructure are planned and implemented to enhance learning. Also referred to as a “demonstration area,” demonstration project,” “adaptive management area,” or “pilot project,” a demonstration site typically features four components: identification of an issue or question to be answered, an action (or set of actions), an assessment of those actions, and a learning strategy for various audiences. Once a demonstration site project is completed, a summary is prepared to document lessons learned, and specific case studies and teaching tools are developed.

Some demonstration sites showcase the application of the current best practices in resource planning, management, and research. They display what results when we follow professional standards, guidelines, and processes. Other demonstration sites are designed to explore what is possible when we venture beyond existing processes and paradigms and allow managers to ask the question, “what if?” For example, What if we awarded a community-based cooperative a timber harvesting contract instead of a commercial logging company? What if we managed the landscape based on watershed boundaries instead of the fragmented boundaries of landowners? What if we allowed visitors to hike our trails without guides?

The ability to ask important questions and test a variety of potential answers keeps our management of protected areas relevant and helps shape the best practices of the future. In addition, because many resource management decisions are full of uncertainty, decision-making affecting a large system may become paralyzed due to lack of definitive and complete information. Demonstration sites empower managers to make decisions at a smaller scale, test the implications, and then decide to scale up or not.

Around the world, protected area managers have used demonstration sites as a tool to test and develop innovative and effective approaches to resource management to commonly encountered challenges and opportunities in protected areas. In recent years, as public use and tourism play an increasingly important role in resource management, demonstration sites now help us explore how to build capacity in designing and

implementing public use and tourism programs and how to efficiently and effectively foster connections between protected areas and the public they serve.

Demonstration sites are designed to:

- Help develop hands-on experience in applying knowledge and skills gained in classrooms and training workshops
- Field test emerging methodologies and technologies
- Adapt existing technologies to new situations or contexts
- Compare options for pending policy shifts
- Allow small-scale testing before making significant large-scale investments

A demonstration site can be a component of a formally established continuing education program. Such sites often host managers and scientists from outside the area, either as part of a course or independently. Above all, demonstration sites provide agencies and managers the chance to take small calculated risks, embrace innovation, and remain open to better ways to protect and conserve our world's natural and cultural heritage.

Characteristics of a Public Use Demonstration Site

Public use generally refers to visitation and recreation by individuals and groups to protected areas and the infrastructure, programs, and services that support those activities (McCool et al. this volume). Visitor centers, trails, guide services, environmental education programs, and special events are all examples of public use.

A good public use demonstration site meets the following criteria (McCool, pers. comm. 2014):

- A receptive and enthusiastic manager and staff
- Supportive agency leadership that is willing to allow local site managers to take small, calculated risks
- A range of social, economic, and environmental conditions broadly representative of those experienced by the agency as a whole

- A variety of visitor and tourism planning challenges and opportunities
- Relatively easy access
- An adequate timeframe for project implementation, evaluation, and decision making
- Engagement of managers and scientists in joint pursuit of knowledge and its dissemination
- An ongoing monitoring strategy to assess the outcomes of adaptive management actions
- A communications program to inform and inspire the audience to learn
- A program of reflection that fosters critical thinking and is open to revisiting decisions when needed
- Systemization of information and adaptation of learning outcomes to other areas of the system.

Demonstration Sites May Vary in Scale and Duration

The design and implementation of any demonstration site or project must take into account the appropriate scale and duration of the demonstration. In some cases, just one or a handful of areas will be designated. In others, the demonstration may encompass an entire system or agency but will focus on one specific aspect of management, for example concession operations, emergency communications, or establishing a visitor use monitoring protocol. A demonstration site may target a specific ecosystem, such as the Amazon Basin, or look to test outcomes across a variety of ecosystems. Similarly, the length of a demonstration project may be limited or a site could be designated for the long-term, recognizing its value as a place where ongoing and consecutive demonstrations will occur.

Regardless of the scale and duration of a demonstration site or project, the critical factor is that the demonstration must be relevant beyond the boundaries of the actual demonstration site. It must provide lessons, tools,

and outcomes to advance the learning and success across the agency and system of protected areas as a whole.

A National Demonstration Project for America's Public Lands

In 1996, the US Congress explored public willingness to support new and expanded user fees to visit protected areas by establishing the "Recreation Fee Demonstration Program" across the USA's systems of national parks, forests, wildlife refuges, and other public lands (RFDP 1996). As incentive to the public and the agencies for this pending policy shift, Congress agreed that most of the revenues collected through the demonstration program would remain at the site they were collected to pay for operations and improvements rather than returned to the national treasury.

Agencies were instructed to develop and implement a variety of fee proposals, supported by business plans. The National Park Service already had a robust fee collection program in place and so experimented with increased fees on a tiered system based on the size of the park. The remaining agencies proposed more than 100 different fee-based projects. Examples included charging a per person entrance fee, fees for use of trailhead parking, multi-unit or multi-agency passes, and fees for special programs and services. Agencies also tested new business methods such as selling passes through third-party vendors and using automated credit card machines at entrances to collect fees.

The public was not happy about paying more to recreate on lands they already supported through taxes, but they were willing to do so when the funds remained on site resulting in visible improvements. After a few years and based on the lessons learned in the Recreation Fee Demonstration Program, Congress established a new comprehensive fee system applied to all agencies with the passage of the Federal Lands Recreation Enhancement Act (2004). This system incorporated the lessons learned during the demonstration period that would lead to the highest level of success and

acceptance. As of 2016, that system was still in place, and, although slated for renewal, will likely stay essentially the same in the foreseeable future.

ICMBio and Partners Create Public Use and Tourism Demonstration Sites

In 2012, Brazil's Chico Mendes Institute for Biodiversity Conservation (ICMBio) initiated an ongoing cooperative agreement with partners US Agency for International Development (USAID), the US Forest Service (USFS), Colorado State University (CSU), West Virginia University WVU), and the University of Montana (UM) to build ICMBio's capacity to encourage and address the growing level of public use and tourism occurring in its protected areas, or conservation units as they are referred to in Brazil. The overall goal of the initiative is to strengthen connections between Brazilian society and its protected areas, especially in the Amazon, by building the capability of ICMBio to provide and effectively manage facilities and opportunities for the public to visit these areas. The protected areas include national parks, national forests, extractive reserves, and sustainable development areas, among others.

In 2014, ICMBio and its partners initiated a Public Use Demonstration Site Program. A major thrust of the initiative was to designate selected protected areas as "Demonstration Sites." At these sites, ICMBio staff and USFS public use specialists jointly agree on what is to be demonstrated, why, how, when, and to whom. Projects are mutually designed and implemented. Once a project is completed, a summary is prepared to document lessons learned and specific case studies and teaching tools are developed.

While each demonstration site might explore different issues, challenges, and/or opportunities, the following principles guide all projects. Projects will:

- Connect Brazilians and international visitors with the country's rich natural and cultural heritage
- Identify, respect, and strengthen the sense of place that protected areas represent, both individually and collectively
- Recognize and strengthen the interconnections that support a sustainable protected area public use program
- Cultivate community engagement and stewardship through a collaborative approach
- Address ICMBio protected area management as part of larger landscapes and social and economic systems
- Integrate public use planning and implementation into the ICMBio mission.

Tapajós National Forest: ICMBio's First Public Use Demonstration Site

The Tapajós National Forest in Pará State was selected as the agency's first demonstration site. The Forest is comprised of 530,000 hectares of Amazon tropical rainforest biome and is located at the confluence of the Tapajós and Amazon Rivers, near the city of Santarém and the popular tourist destination of Alter do Chão. With established and growing regional, national, and international visitation to the Forest, the Tapajós is an ideal choice for a demonstration site focusing on public use and tourism.

The Tapajós National Forest was selected based on the following criteria:

- The Forest's Public Use Manager had participated in a full range of public use training, both in Brazil and some selected courses in the US
- Similarly trained employees from other units were available and also allowed to participate in facets of the demonstration projects

- The Tapajós had a long history of innovation as the first National Forest to conduct research focused specifically on forest management, one of the primary sites of the international Large Biosphere and Atmosphere Research Program, the site of studies in alternative models for forest concessions, and the site of the first community forest cooperative in Brazil
- Public use was already occurring on the Tapajós at the local, regional, national, and even international level and local community members work as guides for these visitors
- The Forest offered significant opportunities to engage with local traditional communities legally residing within the Forest and the community-based Cooperative Mista da FLONA do Tapajós (COOMFLONA)
- The Tapajós is an anchor in a broader regional mosaic of protected areas
- The Forest was in the process of revising the General Management Plan and could model how public use is incorporated in to these all-important guiding documents.

Demonstrating the Development of a Public Use Program

ICMBio is a young agency and relatively new to managing public use, especially in the Amazon Basin where visitation is still relatively low. Initial capacity building and trainings focused on the many different aspects of public use but nothing to date had attempted to put all the pieces together in a unified whole. There was also growing awareness that staffs at the protected area level were facing challenges in taking the broad direction provided by a unit's general management plan and distilling it into decisions at a specific site or project level.

The primary goal of the Tapajós Public Use Demonstration Site was to model how to begin the journey of creating and maintaining a comprehensive and ongoing public use program. In this case, a

comprehensive public use program is defined as containing and integrating planning, development, operations, management, and monitoring components. A secondary and corollary goal was to demonstrate how a series of “implementation” or “tiered” plans help narrow all the possibilities of what “could” be done down to sound decisions about what should be done.

Planning and development involve input into the overall General Management Plan, the creation of tiered zoning and area implementation plans, site and program specific development plans, and detailed infrastructure design and construction plans.

Operations includes all of the ongoing programs and services offered to the public, maintenance of public use facilities and trails, community and partnership engagement, development and oversight of concessions, and special events.

Monitoring involves such functions such as the collection and analysis of visitation data, establishing standards for and measuring visitor impacts, fee payment compliance, enforcement of regulations, emergency communications and response, etc.



Figure 2. Stakeholders gather in Alter do Chão to help initiate the development of an interpretive plan for the Tapajós National Forest.

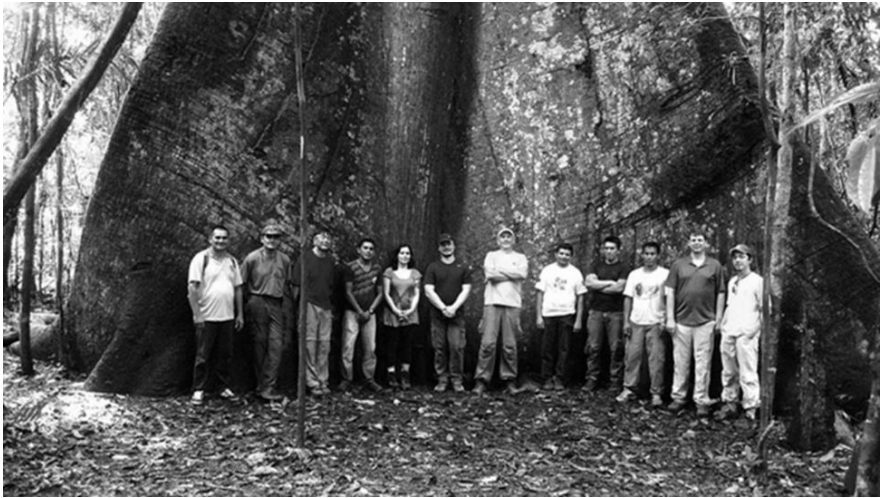


Figure 3. ICMBio and USFS specialists visit the “Grandma Tree” during their inventory and assessment of the 18 km Serra do Gato Trail.



Figure 4. A local university student coordinates with community interviewers gathering visitor use data for the Tapajós National Forest.

Management activities include strategic and tactical planning, current and out-year budgeting, policy development, workforce development, and integration with other protected area programs. Within these broad

categories, specific focus areas for the Tapajós included facilities, trails, interpretation/information, visitor use monitoring, and developing agreements/partnerships. Projects took place in two corridors within the Forest. The Community Corridor along the Tapajós River comprises most of the 25 traditional communities legally residing in the Forest with emphasis given to the three communities closest to the entrance and receiving the most visitation-São Domingos, Maguari, and Jamaraquá. The Terra Rica Corridor includes the entrance base station, a timber storage and sort yard, access to two research towers, and the Terra Rica site which currently functions as a day use area. Please refer to Table 1 below for a summary of the Tapajós Public Use Demonstration Site projects.

In addition to site-specific actions and projects, a variety of tools for public use planning and management were designed into and evaluated during the demonstration project including:

- Place-based planning methodologies for overall public use and tiered implementation plans focusing on trails, interpretation, and visitor experiences/tourism.
- Visitor and community use and experience satisfaction monitoring.
- Community engagement through meetings and collaborative projects conducted through existing cooperatives.
- Training that ranged from broad-based professional development to specific skill development.

Demonstration in Action: The Terra Rica Corridor

Prior to the Tapajós Demonstration Site, the Terra Rica Corridor already received public use. Tourists from Alter do Chão and local school groups visited the site. The primary goal of the trip was to visit a large Sumauma or Kapok tree located about 200 meters from the open parking area. The tree is located within second growth forest interspersed with introduced rubber trees still tapped for latex by traditional community residents.

Table 1. Tapajós Public Use Demonstration Site Overview

Public Use Program Component Planning	2014 Projects	2015 Projects	2016 Projects
	<p>Interpretation/Information: Develop Forest Interpretive Plan</p>	<p>Interpretation/Information: Complete Interpretive Plan</p> <p>General Management Plan Revision: Assist in review and input into Public Use portion of plan</p> <p>Implementation Planning: Develop Corridor/Area Analysis and Implementation Plan Framework.</p> <p>Draft Terra Rica Corridor Plan</p> <p>Draft Community Corridor Plan</p>	
Development	<p>Trails: Design and construct Terra Rica Trail</p> <p>Interpretation/Information: Design and install 7 Terra Rica Trail interpretive signs</p>	<p>Interpretation/Information: Design and install interpretive exhibits at Alter do Chão CAT</p> <p>Design and install 8th sign for Terra Rica Trail</p> <p>Design and install 4 community trailhead signs</p>	<p>Interpretation/Information: Design and install 2-3 signs along Terra Rica Corridor</p> <p>Design and fabricate “portable interpretive trail” signs for community trails</p>

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Table 1. (Continued)

Public Use Program Component	2014 Projects	2015 Projects	2016 Projects
	Design and install 3 Community welcome signs Design and install 4 Forest orientation signs	Facilities: Using a Landscape Architect, develop site development concepts and drawings for Terra Rica Site, São Domingos Visitor Center	Facilities: Determine if river access to the Sao Domingo's Visitor Contact Center should be via dock and stairs, or a retaining wall and ramp
Operations	Trails: Review and practice trail maintenance techniques as part of Terra Rica Trail construction Complete trail condition assessments on 2 of the community trails	Interpretation/Information: NAI Certified Interpretive Host Train-the-Trainers Course (in USA) ICMBio staff help train the community and partner staff operating the CAT	Trails: Explore the idea of a Community Trails Team made up of participants from each community and with the intent of working on each of the community trails together Interpretation/Information: Interpretive Host Training Team conducts an Interpretive Host Training for Tapajós guides
Monitoring	Visitor Use-Monitoring: Community Corridor	Visitor Use-Monitoring: Community Corridor Terra Rica Corridor	Visitor Use Monitoring: Community Corridor Terra Rica Corridor Site-specific monitoring for issue resolution at Jamaraquá

Public Use Program Component	2014 Projects	2015 Projects	2016 Projects
Management Activities	Partnerships: Explore feasibility of COOMFLONA expansion into tourism management and presence in Alter do Chão	Partnerships: Develop partnership agreement with municipality and other parties associated with Alter do Chão CAT	<p>Partnerships: Determine appropriate organization and agreement vehicle for coordinating community-based tourism activities via a single association as opposed to community by community.</p> <p>Explore the feasibility of either a partner (INPA?) or concession operation to take on overall management of the Terra Rica Corridor.</p>
National Issues	Remote site emergency communications and first aid response, training, and supplies	Impacts of pending system-wide reduction of national entrance security contract	Begin formalizing ICMBio Demonstration Site Program

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Originally the site had served as the administrative headquarters for the National Forest. When that office moved to Santarém, some buildings were torn down to the foundations while others were left to fall into disrepair. There had been water to the site but the well no longer functioned. Visitors to the area had to bring their own food and water. There were no toilets. Interpretation, if any, was provided by tour guides and teachers.

The management goal for Terra Rica was to improve the current visitor experience and lay the foundation for future development, all within the capacity of the Forest to deliver. The newly completed Forest interpretive plan identified Terra Rica as a high value site to interpret the Amazon ecosystem. In the Demonstration Site's first year, the existing 200 meter path was extended to 2.5 kilometers. A series of 8 interpretive signs were fabricated using local artists and installed along the trail. A covered picnic shelter was added near the parking area as well as the last minute addition of a flush toilet. Once the site was completed, visitor use monitoring began. A Forest orientation panel was also installed at Terra Rica Base, the point of entry into the corridor.



Figure 5. Community and cooperative members help lay out and extend the Terra Rica Interpretive Trail.



Figure 6. The team puts the finishing touches on one of the eight interpretive sign kiosks installed along the trail.



Figure 7. Local craftsmen mount the finished interpretive panels into custom-made frames.



Figure 8. The entrance base station for the Terra Rica Corridor now offers a Forest orientation panel to welcome visitors.

In the second year, visitor use monitoring indicated that visitors enjoyed the interpretive trail experience but felt a conflict between its message to value the forest and the evidence of active forest management occurring on the way to the site. This highlighted the need for a more comprehensive approach to the entire corridor. A Corridor Analysis and Implementation Plan (Corridor Plan) was completed indicating some immediate options to expand the interpretive story. It also identified the need to establish a longer-term partnership and/or concession to operate and maintain the site. A USFS landscape architect completed a site concept plan to guide future infrastructure developments at both the base station and the day use site in a well-thought out manner. Visitor use monitoring continued for a second year. Based on the results of the Corridor Plan, until the site's ongoing operational capacity is expanded, no further infrastructure development will take place along the corridor with the exception of the design, fabrication, and installation of 2-3 interpretive wayside panels addressing multiple use, sustainable forest management, and research.

The Terra Rica demonstration projects accomplished much more than physical improvements to the site. The trail layout and construction involved the expertise and hard work of local residents, ICMBio staff from the Tapajós and other units, USFS and university technical experts, and

members of the community-based cooperative, Cooperativa Mista da Flona do Tapajós (COOMFLONA). Similarly, the interpretive sign development involved ICMBio staff, USFS and university technical experts, and local artists, craftsmen, and digital production specialists.



Figure 9. ICMBio and USFS specialists confer with the local artist chosen to create the panels for the Terra Rica Interpretive Trail.

Several training methods were employed including formal instruction, train-the-trainer opportunities, on-the-job training, and mentoring. The sequencing of projects demonstrated the flow of public use program creation from planning, to development and implementation, and on to monitoring and operational considerations, along with identifying and tackling the management actions that support the overall effort.

As with any effort, there were also some important lessons learned. Agency and partner goals may align on one project but not another. You have to find the right partner for each project and sometimes that means finding a new partner. In Alter do Chão, it ultimately made more sense to work with the municipality to jointly develop exhibits for the Community Tourism Center (CAT) than to encourage COOMFLONA to expand into a new tourism business venture. Success can generate enthusiasm but that same enthusiasm can result in poorly executed products if you abandon the principles of planning. The original plan called for evaluating the well and

pump and various “dry” or chemical toilet options for the day use site. This did not happen. The pump at Terra Rica was not adequate to operate the flush toilet, resulting in a non-functioning restroom. The projects also served as a reminder that the visitor experience includes the entire experience. All of the components of the trip must align for a successful offering and the delivery of consistent messaging.

The Process of Institutionalizing Demonstration Sites

The Public Use Demonstration Site at Tapajós demonstrated the value of this tool. Based on the evaluation of the first year’s projects, outcomes, and lessons learned, ICMBio began the process of formalizing a Public Use Demonstration Program within the agency. This includes:

- Defining the goals and desired outcomes of such a program
- Developing criteria and a process for selecting new demonstration sites and projects
- Identifying the most pressing issues and compelling opportunities to address through demonstration
- Establishing documentation protocols
- Creating the repositories and channels through which demonstration site lessons and tools will be disseminated across the agency
- Incorporating outcomes and tools into agency training curriculums
- Sharing significant case studies with the international protected area community

While fully developing and implementing such a program will take time, ICMBio has identified the following desired outcomes for the overall program and the individual projects that comprise it. Demonstration sites and projects will:

- Contribute to sustainable communities and public lands
- Enhance public use opportunities in appropriate and resilient public use settings

- Leverage resources and increase the capacity of ICMBio and partners
- Promote citizen participation, stewardship, and shared responsibility
- Strengthen connections between Brazilians and their public lands

Initial Demonstration Site criteria are:

- Unit is already experiencing public use
- Unit is undergoing or has recently completed a General Management Plan that is incorporating more extensive public use
- Unit serves as an anchor for a mosaic of nearby protected areas
- Unit has a Chief that supports the Demonstration Site emphasis
- Unit has a Public Use Manager who has preferably completed several national level trainings conducted by USFS and partners, both in Brazil and the USA
- Lessons learned on the unit can be applied more broadly across the National System of Protected Areas (SNUC)

Below are some key insights gained at Tapajós that may also contribute to the overall concept of ICMBio Demonstration Sites (2015 Accomplishment Report):

The Question of What Is to Be Demonstrated Drives Each Demonstration Site Project

Demonstration projects are designed to build the capacity of ICMBio to strengthen connections between Brazilian society and its natural environment through well-managed public use. However, these projects are not easy to implement due to remoteness, lack of on-site technical and skilled labor, and level of staff time to adequately discuss and design

successful demonstrations. Careful consideration and focused support is critical when embarking on these projects.

- *Assessment of project implementation and outcomes is fundamental to building the learning needed to advance ICMBio capacity:* Such assessment involves not just detailing project outcomes but also joint reflection of the project design and implementation procedures to determine how future projects could be strengthened and improved.
- *Individual projects must be clearly related to the protected area's general management plan and related implementation plans:* They must also highlight the linkages between planning, development, operations, monitoring, and management activities. A series of projects should be integrated as fully as possible to contribute to a cohesive public use program.
- *Much public use planning and management requires partnerships or concession agreements between the government, private sector, and local communities:* There is limited capacity in ICMBio to fully implement all the infrastructure, actions, and programs needed to efficiently connect with Brazilian society. Demonstration sites can enhance ICMBio capacity by showing how collaboration and partnerships can leverage existing ICMBio programs to provide opportunity for the public to access protected areas.

CONCLUSION

Three Years of Impacts and Outcomes from the Tapajós Public Use Demonstration Site

While ICMBio is likely to turn its attention to other protected areas and new demonstration projects in the years to come, the work at Tapajós

achieved significant impacts and outcomes for the agency to grow from and build on (2015 Accomplishment Report). The Tapajós Demonstration Site:

Helped Develop the Foundation for a System of Visitor Use Monitoring

This system was tailored for Brazil but also consistent with questions and methodologies used internationally: While the monitoring effort was coordinated by WVU, the program employed local graduate students and residents of the traditional communities to collect the data. The questionnaire and sampling methodology has also been initiated at several other protected areas and in cooperation with the Brazilian University of Ponta Grossa.

Helped to Inform the Forest's General Management Plan Revision Process

The Tapajós is the first National Forest in the system to revise its management plan based on new ICMBio policy and direction. Discussions with agency planning staff from Brasília helped expand their understanding of public use in general and the specific implications of proposed direction. This is likely to create a ripple effect as future revisions look to the Tapajós General Management Plan for precedent.

Showcased the Importance of the Interpretive Planning Process as an Effective Engagement and Stewardship Tool

One of the first projects at Tapajós was to develop an interpretive plan to determine the Forest's most compelling stories and how to deliver those messages consistently and effectively. While this is an agency document, the content was developed using community stakeholder workshops which built broad-based involvement, ownership, and support in the resulting projects and services. The interpretive plan incorporates their stories into those of the Forest. ICMBio is seeking ways to expand community

engagement in protected area management. The experience at Tapajós showed that the interpretive planning process can be an effective tool to begin this engagement for both agency staff and local stakeholders.

Developed a Draft Area/Corridor Analysis and Implementation Plan Framework

To meet the demonstration site's secondary goal, USFS and Tapajós staff created a tool consisting of 29 questions to help analyze site specific decisions and their operational and management implications. The team then used this tool to analyze the Community and Terra Rica Corridors and felt comfortable with the results. While the process was consistent the results called for different management strategies in each of these corridors. This analysis framework will next be tested in Anavilhanas National Park to validate its potential use across the system.

Helped Document Next Steps and Highlight Issues at Both the Local and National Level:

The implementation plans, tools, and detailed project documentation have provided program continuity at Tapajós even as the Forest welcomed a new Chief and Public Use Manager. Nationally, several issues initially identified at Tapajós have been echoed across the system such as the need for improved equipment and procedures for emergency communications and first aid response for agency personnel, partners, and contractors. The idea for a national workshop focused on working with landscape architects emerged out of the site planning conducted at Tapajós.

Helped Raise Public and Visitor Awareness

One outcome from the Tapajós Interpretive Plan and partnership discussions was the decision to "bring the Forest to the visitors" at Alter do Chão with the renovation and installation of exhibits in the Community Tourism Center (CAT). This has raised awareness of the Tapajós and several other protected areas in the region. It also provides visitors an opportunity

to learn more about trips to these units and to purchase products made by local cooperatives and traditional communities.

Reflected the Brazilian Context

While the projects were based on professional standards and best practices for protected areas around the world, each was tailored to reflect Brazilian conditions, policies, and character. For example, community engagement recognized the variety of formal civic leadership councils active on the Forest. The visitor use monitoring questionnaire explored dropping questions on personal income that US respondents don't mind answering but Brazilian respondents do. Interpretive panels featured the vibrant artwork created and prized by Brazilians.



Figure 10. The CAT in Alter do Chão was recently renovated as a partnership between the municipal government, the Tapajós National Forest, and others, offering visitors a chance to learn about and arrange visits to the region's protected areas.

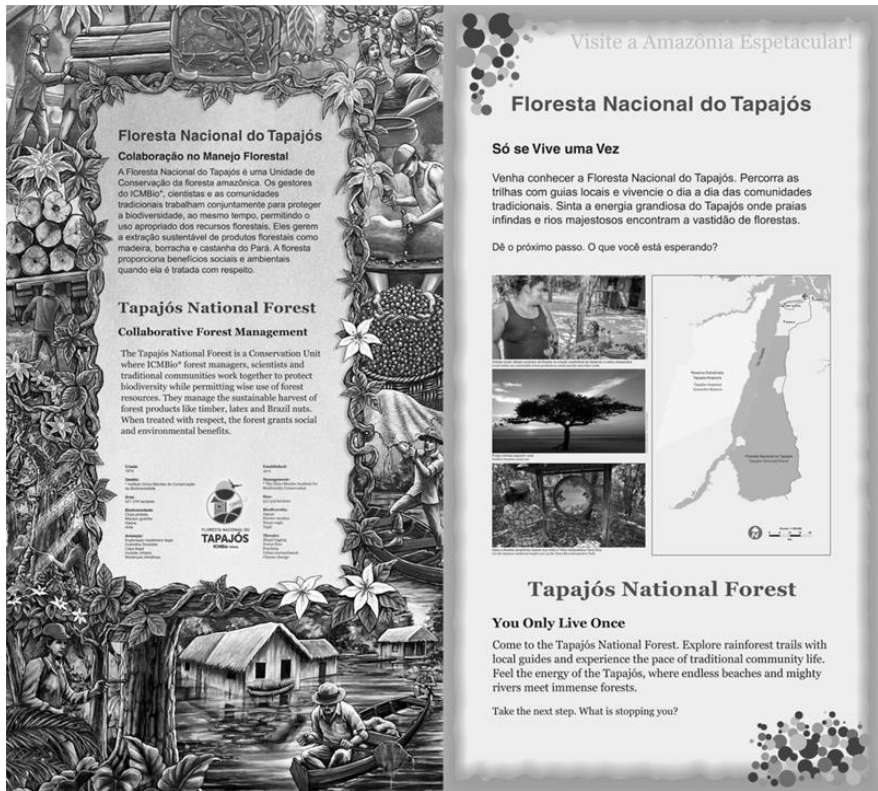


Figure 11. Final artwork for the exhibit panel featuring the Tapajós National Forest installed in the Alter do Chão CAT.

System-Wide Long-Term Impacts and Outcomes

Beyond the specific projects, lessons learned, and outcomes generated by the Tapajós Public Use Demonstration Site and others that follow, there are long-term benefits to a strong Demonstration Site Program.

Going Beyond Classroom Training

When integrated with more formal workshops and seminars, demonstration sites can play a role in transforming participants into practitioners and on to instructors. Here is an example. In 2012, the USFS

conducted an Interpretive Planning Workshop for twenty ICMBio staff from across the system. In 2013, six of these original students were invited to join USFS staff conducting a repeat of the workshop as instructor trainees. One of these trainees was the Public Use Manager for the Tapajós National Forest who went on to participate in the development of the Forest's Interpretive Plan and resulting products. Five of the 2013 trainees plus one of the 2013 participants were selected to attend a National Association for Interpretation "Certified Interpretive Host Train-the Trainer Course" in Fort Collins, Colorado in summer 2015. Later that fall, three of these individuals teamed up to conduct a 3-day Interpretive Host Workshop for the community tour guides serving the Tapajós National Forest. A second workshop was conducted by the trainers in 2016 for guides serving Anavilhanas National Park, a newly designated ICMBio Demonstration Site.

As the next step in development, members of this cadre will work with USFS specialists in late 2016 to create an interpretive plan for Anavilhanas. In 2017, these individuals started to lead the interpretive plan development for Brasília and Chapada dos Veadeiros National Parks (also new demonstrations sites), with USFS specialists on hand to help mentor as needed. By 2018, ICMBio will have developed a basic level of internal capacity to train its employees and support the interpretive planning function for the agency. Similar paths to development are occurring in the trails arena. There is a powerful synergy in the linkage between formal training courses and demonstration sites.

Building Confidence

A key component of building capacity is building confidence, both in individual employees and in an institution as a whole (see McCool et al. this volume). The example noted above is just one way ICMBio is building confidence. Confidence also comes from helping to identify the questions that shape a demonstration site, evaluating the lessons learned, and working together to shape new policy based on those lessons. As skill and confidence grows, ICMBio will be more effective in developing, operating, and sustaining public use programs that will help it achieve its goals.

Building a Brazilian Body of Work

While it is great to learn from people and projects world-wide, tangible examples, tools, and case studies from Brazilian protected areas created in a Brazilian context and addressing Brazilian issues and needs are much more powerful, not just for public land managers but for the Brazilian people. A Brazilian body of work generates pride and helps build a commitment to stewardship of these national natural and cultural treasures.



Figure 12. Vibrant artwork from the Terra Rica Interpretive Trail panels celebrates the Amazon ecosystem.

Inform Policy Development

As a new agency, ICMBio is only beginning to define the full range of policies and develop the guidelines and handbooks that will guide and strengthen the management of the national system of protected areas it is responsible for. Demonstration sites can play a critical role in helping identify and develop those policies.

Controlled Risk...Getting Beyond Analysis Paralysis to Implementation

When an agency lacks clear policies, there is a tendency on the part of employees and leaders to avoid taking action they may later get in trouble for. Any and all decisions, even small ones, are often made at the highest levels. This situation is referred to as “gridlock” or “analysis paralysis.” When, as noted above, there is a path identified to achieve policy development and tools are tested that most can agree will lead to sound decisions by local leaders, capacity is increased and programs can move forward to accomplish the desired goals in serving the public. Demonstration sites provide that forum where small, controlled risks can be taken and options explored in an environment that is made safe for all participating.

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Chapter 10

**FREEDOM, SUSTAINABILITY AND THE
COMPETING DISCOURSES OF TOURISM
AND MINING IN THE ESPINHAÇO RANGE
BIOSPHERE RESERVE, BRAZIL**

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ABSTRACT

The Chinese demand for minerals caused iron ore to reach record prices in the 2000s. As a result, a development policy focused on mining replaced the relatively successful sustainable tourism programme in the Espinhaço Range Biosphere Reserve, Brazil. Since then, a large number of socioenvironmental conflicts have erupted in this region. These conflicts are underpinned by power relations and values that have historically governed the state's development priorities, therefore giving them context-specific complexity. This chapter assesses the impacts of this process on

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the communities affected by the Minas-Rio Project through a conceptual framework based on a view of sustainable development derived from a theoretical dialogue between the disciplines of economics and pedagogy, and focused on the expansion of individual conscious freedoms. The impacts include the collapse of an institutional arrangement that had been established over time to promote a sustainable tourism programme, the region's transformation from a quiet place into a busy industrial site, the consequences of a floating population of temporary workers, and the establishment of a divided society. This paper concludes that the replacement of tourism by mining followed an imposed modernization, and has not contributed to a more sustainable development. However, it is argued that the negative impacts of the mining project have generated a more conscious and critical society. A resistance movement has emerged within the affected communities to fight for their rights and to monitor the impacts of the mining project. These conscious people are arguably more capable of contributing to future generations to achieve a more sustainable future.

Keywords: tourism, sustainable development, freedom, conscientization, Espinhaço Range Biosphere Reserve

INTRODUCTION

Development and sustainability belong to a group of words that are frequently used in the contemporary technical and political rhetoric, but have very flexible and vague definitions, as is the case with democracy, justice and other widely used terms. This vagueness enables the terms to be interpreted differently according to the interests and ontological assumptions of the observer. For example, the concept of sustainability for an indigenous leader wishing to protect his traditional land is completely different from the concept of sustainability defined by a mining company intending to explore minerals from this same land. Economic growth can either help or undermine sustainability, depending on the actor's perception. Despite their different interpretations, both company and indigenous leader support the same sustainable development discourse in the policy arenas where public actions and policy outcomes are decided.

Reflections on the vagueness of ‘sustainability’ and ‘sustainable development’ are vast in the literature (Mebratu 1998; Moffatt 1996; Reid 1995). There are also numerous definitions of ‘development’ (Cowen and Shenton 2005). In the current political debate, such terms are so imprecise that they are able to gain support from people and institutions that sometimes defend antagonistic positions.

This chapter proposes a theoretical-practical reflection of the concept of sustainable development through the analysis of a case-study in the Espinhaço Range Biosphere Reserve (ERBR), Brazil, where in the late 2000s local and regional priority development policies replaced a relatively successful sustainable tourism programme with mining. During the environmental licensing debates, the sustainable development discourse adopted was a conservative storyline of modernization, dangerously disguised in alternative discourse (Fazito et al. 2016). A reflection of the concept of sustainable development is needed given the abundant use of the expression in both policy and academic rhetoric and consequent problems transforming the words into actual innovative policies. In other words, a better theoretical and practical understanding is needed to help minimize the problems related to operationalization of the sustainable discourse (Butler 1999; Hunter 1997).

The UNESCO Man and Biosphere Programme (MAB) incorporated the concept of sustainable development into the biosphere reserves’ objectives. Thus, these regions would benefit from a thorough discussion of the sustainable development paradigm, given its important role in global geopolitical affairs. The theory developed in this chapter is illustrated by the case of displacement of sustainable tourism in the development policies of the ERBR, and the establishment of the Minas-Rio Project. This theoretical-practical reflection follows the ideas of B. Santos (2002; 2004) which state that traditional research has neglected contextualized social practices in its eternal pursuit of producing generalizations, but that research in the social sciences only makes sense when it incorporates such processes into its analyses (Flyvbjerg 1998).

TOWARDS A BROADER CONCEPT OF SUSTAINABLE DEVELOPMENT

The historical view of development was that it was a natural process of human evolution towards civilization; the simple idea of time passing. However, with the emergence of the positivist philosophical tradition, theorists sought to explain social processes, based on the recognition of patterns and relationships of causality that explained natural phenomena. Thus, according to Cowen and Shenton (2005), development studies emerged with the invention of the social sciences. The authors argue that the concept of development in the context of industrialization and capitalism has two sides: a constructive side, which envisages progress towards industrialization; and a destructive side, represented by poverty, violence and inequalities that result from progress. Thus, in moments of progress, development is a forgotten concept, but during crisis, it emerges and dominates the political debate.

Harry Truman's Point Four Inauguration speech, in 1949, suggested a new framework to guide global relations between Northern and Southern countries to replace colonization. This paradigm suggested a development line in which all societies could be placed and ranked. This so-called modernization, as it was theorized by Rostow (1960), which defined development by technological advancement and a society of high consumption, created dichotomies, such as traditional and modern, rural and urban, underdeveloped and developed. Despite its simple and superficial basis – which only considers economic values in the development process and neglects the destructive side of development – modernization remained the global hegemonic development discourse diffused worldwide (Porter and Sheppard 1998).

Since the post-WWII era, several alternative paradigms of development have emerged, but modernization remains dominant. Moreover, it evolved and was exacerbated by the time-space compression, shorter product life-cycle and rational products distribution that have characterised globalization (Harvey 1989). Among these alternative paradigms, the United Nations

Economic Commission for Latin America criticized the dependency of peripheral countries on the central ones (see Prebisch 1986). It was the first group of researchers to academically challenge the European-centric academic development discourse (Tucker 1999). This critique formed the basis of the 'dependency theory', which argues that underdevelopment is not an original condition to be overcome by closer integration to the world's economy, but rather a process brought about by the nature of this integration (Frank 2004). Dependency theorists have criticized modernization as an ideology used to justify western involvement and domination of southern countries (Telfer 2002). However, given the anti-imperialist perspective of dependency theory, it failed to be actively considered, at least in Latin America where, since the 1954 coup d'état in Guatemala, governments that have proposed anything different from the desires of US policy, have been halted by direct or indirect North American intervention.

The environmental paradigm has generated perhaps the most celebrated alternative discourse of development; this being sustainable development. As argued earlier, the vagueness and ambivalence of the Brundtland Commission's definition has transformed sustainable development into the best way to develop, without saying which way this is. Irving et al. (2005) described a *sine qua non* condition that may lead to sustainability, which is actual stakeholder participation in the decision-making process as a means to achieve citizenship. Thus, citizenship is a result of agency, but agency is only acquired through critical and emancipatory education.

The economist Amartya Sen (1999) argues that an alternative to the income-oriented view of development is the freedom-oriented view of development. He generalises the concept of development as the process of expansion of real freedoms that people enjoy, with particular attention paid to the expansion of individuals' capabilities to lead the kind of lives they value. Sen explains that freedom is central to the process of development for two distinct reasons: the 'evaluative reason', whereby progress is assessed by whether people have enhanced freedoms, and the 'effectiveness reason', whereby development depends on achieving people's free agency. The latter corroborates the idea of sustainability defended previously in Irving et al. (2005). Sen states:

“The people have to be seen... as being actively involved – given the opportunity – in shaping their own destiny, and not just as passive recipients of the fruits of cunning development programmes.” (Sen 1999, p. 53)

Sen’s ‘capability approach’ has been mostly applied to address its evaluative reason, through the generation of new development indicators (eg. Human Development Index), and to move the development concern from income and wealth to human freedoms. But its agency aspect – effectiveness reason – needs to be further explored in the literature (Fukuda-Parr 2003; Robeyns 2006).

The educator Paulo Freire developed a politicized concept of human development, in which educated people should be able to understand the context in which they are inserted and be able to criticize it. Freire’s concept of ‘conscientization’ refers to an educational process that allows people to acquire critical consciousness (Freire 1970, 1973). This process is described as the body that acts coherent to what it thinks, feels and says, in an exercise of the freedom to dream, to choose and participate in what is needed to achieve what is desired. ‘Conscientization’ is the path toward freedom, since it is based on the acquisition of critical consciousness and the achievement of autonomy. ‘Conscientization’ and autonomy empower people to challenge the *status quo*. The oppressed, when conscious and free, can reframe development.

If Sen’s economic perspective was for societies to develop agency and expand individual freedoms, Freire’s educational theory seeks to educate individuals to reach their potencial to influence the structures of power and reframe the development of a society. Economics and Pedagogy are two disciplines that have long explored human development and should keep a constant and deep dialogue in the literature. The concept of sustainable development championed here is, therefore, a result of this dialogue: it is only achieved by expanding individuals’ conscious freedoms, so that people can understand the context in which they are inserted, fight oppression and, at the same time, respect the social contracts and the ‘rules of the game’. Concientization empowers people to know and respect these rules,

considering the pleasure and the sense of responsibility that are also triggered by this involvement (C. Santos 1988). If modernization has caused inequalities and environment destruction (Escobar 1995; Meadows et al. 1972; Sen 1992), it is self-destructive, and its deconstruction will be the result of the actions of conscious social movements (Escobar 2005; M. Santos 2011; Tomlinson 2003).

The next sections describe the case study selected to illustrate this chapter's discussion and show the impacts of the Minas-Rio Project on the region, with a particular emphasis on the application of the concept of sustainable development applied in this chapter.

MAB PROGRAMME AND THE ESPINHAÇO RANGE BIOSPHERE RESERVE

The Man and Biosphere (MAB) Programme was a result of the UNESCO Conference on Biosphere, held in Paris in 1968. It was launched in 1971 and its primary objective is to promote knowledge and practice to help improve the relationship between humans and nature around the world. It targeted the reduction of biodiversity loss through its ecological, cultural, social and economic dimensions. The MAB Programme was revised in 1995 in response to the 1992 Conference on Environment and Development (UNESCO 2009).

According to the Statutory Framework of the World Network of Biosphere Reserves (UNESCO 1996, page 16),

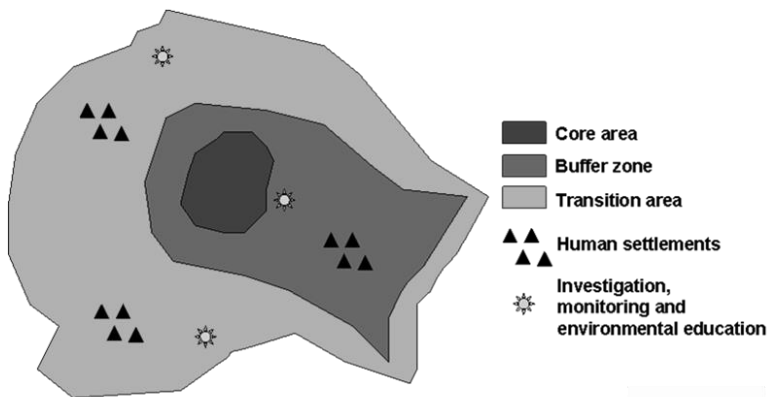
“Biosphere reserves are areas of terrestrial or coastal/marine ecosystems or a combination thereof, which are internationally recognized within the framework of UNESCO's programme on man and biosphere (MAB).”

Biosphere reserves form a global network of areas that aim to protect biodiversity and encourage sustainable use of their resources, and remain

under the sovereignty of the individual state where they are located. A biosphere reserve has three main objectives (UNESCO 1996), to:

- 1) contribute to the conservation of landscapes, ecosystems and biodiversity;
- 2) foster environmentally and culturally sound economic and human development; and
- 3) promote logistical support for demonstration projects, environmental education and training, and research.

Among the criteria to become a biosphere reserve, a prospective area should encompass legally constituted core areas of long term protection, a buffer zone in the hinterlands of the core areas where only activities compatible with the conservation objectives can take place, and an outer transition area where sustainable resource management practices are promoted and developed. Figure 1 shows a model of a biosphere reserve.



Source: Adapted from UNESCO (1996).

Figure 1. Simplified Model of a Biosphere Reserve.

The Espinhaço Range Biosphere Reserve (ERBR) is located in the state of Minas Gerais, in Brazil's Southeast region. It was recognized by UNESCO in 2005 and is part of a wider Brazilian network of UNESCO biosphere reserves, which also include the Mata Atlântica (1993), Cerrado

(1993), Pantanal (2000), Caatinga (2001) and Central Amazon (2001). It hosts ecosystems that are typical in three other Brazilian biosphere reserves: cerrado (savannah), caatinga (semi-arid) and mata atlântica (rain forest). Cerrado and Mata Atlântica are listed as two of the world's 25 'hotspots' for conservation priority (Myers et al. 2000).

The ERBR covers an area of 3,076,457.80 ha and crosses 53 municipalities. It hosts 69 protected areas, 11 of which have been turned into core areas. The ERBR's area is divided as follows: 204,522.14 ha of core areas, 1,879,996.65 ha of buffer zone and 991,939.01 ha of transitional area (Minas Gerais 2005). The core areas represent parts of a mosaic of ecosystems to be linked by ecological corridors, which is the main agenda proposed by the ERBR committee.

The ERBR's fragile and important ecosystem is demonstrated in the *campos rupestres* (rocky fields), which host a high diversity of species that interact with each other in a very complex manner. A great number of both flora and fauna species are endemic to the Espinhaço Range, and several of these species are endangered. The survival of *campos rupestres* and their endemic species depends on a very fragile equilibrium. Cultural diversity in the ERBR is also unique, as a result of the melting pot of habits and values brought to the region by native indians, European and African slaves throughout history. The ERBR is home to native indigenous groups, religious communities and several *quilombola* or maroon, former slave, communities.

The ERBR's climate has not allowed large scale agricultural development. However, given that the region is very rich in minerals, the extraction of diamonds and gold represented a major source of income during the colonial era. In the 20th Century, a great part of the southern ERBR was occupied by iron extraction. Mining, both at an industrial scale and informal small-scale mining (*garimpo*) has caused severe environmental degradation throughout the region. Mining remains the region's main economic activity, with iron extraction being most predominant. Brazil is responsible for 15.5% of global iron ore production, while Minas Gerais State accounts for 69.9% of the Brazilian production. Among the 53 municipalities located in the ERBR, mining is carried out in 30 of them. In

the 2000s, global iron ore prices increased due to Chinese demand, which made iron ore extraction feasible in the ERBR's central area. During that time, several mining projects were launched, including the Minas-Rio Project, which consists of a mine, an electricity transmission line, a 525 Km pipeline to transport iron ore to the Port of Açu, in the state of Rio de Janeiro, and the port itself. The mine is mainly located within the territory of Conceição do Mato Dentro (CMD) – it crosses the neighbouring municipal boundaries of Alvorada de Minas and Dom Joaquim – and received its environmental license to operate in 2014.

The ERBR also has important tourism potential, with its historical sites and natural areas, and therefore tourism has been given priority status by the government. Recognition of the region as a biosphere reserve was the result of an environmental movement that emerged in the early 1990s to protect the Tabuleiro waterfall, located in CMD. At the time, this town was known as the 'capital of ecotourism', but the Minas-Rio Project, launched in 2006, has caused the displacement of tourism in the region's priority development policies. An analysis of the competing rationalities behind tourism and mining in the ERBR has shown that the sustainable tourism discourse, when challenged by mining, has incorporated a view of tourism as an industry (Fazito et al. 2016). However, in terms of generating jobs and expanding income and wealth, tourism is much less important than mining. Denial of the potential for tourism to be a critical and transformative force (Higgins-Desbiolles 2006) in the policy arenas of the ERBR has caused it to be replaced by shallow rhetoric of 'sustainable' mining. The impacts of replacing tourism in the ERBR with mining are explored in the next section.

IMPACTS OF REPLACING TOURISM WITH MINING IN THE ERBR

There are many examples of conflicts between mining and tourism in the ERBR, such as in the towns of Ouro Preto and Diamantina. Ouro Preto is a former capital city of Brazil and the ERBR's most important tourist destination, although most of its income comes from a bauxite mine.

Diamantina is a well preserved colonial city impacted by *garimpo*. Another example of conflict is Serra da Gandarela, a huge iron mine that is set to operate in the outskirts of Belo Horizonte and could impact the city's water supply. However, establishment of the Minas-Rio Project in the central area of the ERBR is a critical case, due to a controversial environmental licensing process marked by evidence of human rights violations made public in a documentary film (Valle 2009), research papers (Becker and Pereira 2011a; Becker and Pereira 2011b), a consultancy report (Diversus 2011), a letter from the resistance movement to the Public Prosecutor (MOVSAM et al. 2012), and in many minutes of public meetings organized by the Public Prosecutor's Office. The effort was justified with the 'inherently good' expansion of wealth and income, thus characterizing an authoritarian imposition of modernization on a traditional society. The final environmental license was granted to the mine in 2014, but construction of the mine has affected the region since it was launched.

After 2006, the economic profile of the municipality that was most affected by the mining project, Conceição do Mato Dentro (CMD), changed completely. The town shifted from a service-oriented economy to an industrial site (see Figure 2). The service-oriented economy was a result of the former sustainable tourism programme (1995-2005), which also impacted agricultural production and the services associated with food production.

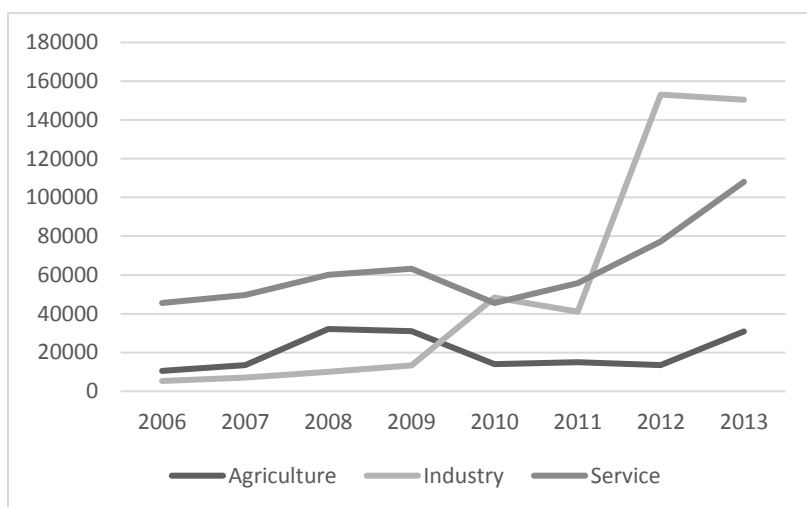
The economic change has led to important impacts on the communities affected by the mining project. The impacts of the Minas-Rio Project on the region have been widely published (see for instance Cidade e Alteridade 2013; Cidade e Alteridade 2015; Becker and Pereira 2011b; Becker and Pereira 2011a; Fazito et al. 2016). However, in order to proceed with the comparison of the previously explored sustainable development theory, the classification of these impacts should be noted: collapse of the institutional arrangement established to promote a sustainable tourism programme, fast transformation from a quiet place to a busy industrial site, temporary workers who established a floating population of 7,000 people in CMD and related consequences, and creation of a divided society. Documentary and bibliographic evidence (minutes of meetings, environmental impact assess-

ment reports, official documents, theses, articles, studies) were triangulated with research on how the resettled families perceived these impacts, which was conducted in 2015 and 2016 with 12 families and the leaders of the resistance movement against the Minas-Rio Project.

The institutional arrangements to promote sustainable tourism as the regional development option for CMD were discontinued due to the establishment of the mining project (Becker and Pereira 2011b). During the evolution of the CMD environmental movement, in the 1990s and 2000s, there was evidence that the actions, such as the establishment of protected areas and the creation of policies, were decided by a small group of people with support from the local and regional elites (Fazito et al. 2016). This elitist process kept the local communities distant from the decision-making process. Sustainable development, as it was conceptualized previously, understands that local people should be agents and not recipients of development policy decisions (Sen 1999; Irving et al. 2005). Thus, at its core the ‘sustainable tourism’ programme was not sustainable. When the Minas-Rio Project was launched, the communities supported it given its promise to expand their incomes, despite opposition from the local government and the environmental movement. Without the support of the communities, the sustainable tourism programme became a fragile discourse when challenged by the mining discourse. A few months later, many members of both the environmental movement and the government changed sides and began to support the mining project. The few actors who remained against the project faced a coalition of transnational companies and the state government. The result was an authoritarian imposition of modernization/industrialization through mining.

In the studies, there are numerous statements from the people of CMD and its surroundings about how life was “better,” “quiet,” “clean,” and “peaceful” before the establishment of the mine and how it became “dangerous,” “unhealthy,” “violent,” “polluted,” and “noisy,” etc. (Cidade e Alteridade 2015, page 73). Even the promised good economic impacts were challenged. A farmer stated:

“No one buys my products in the market because they know my land is poisoned by the company. I used to earn R\$ 2500 (US \$773) a month, and now I cannot make R\$ 500 (US \$150). I had to take my children out of school... The water on my land is poisoned. Chickens are dead, pigs are dead and cows and steers are sick.” (Public Meeting in the Sapo District, 17th April 2012)



Source: Brazilian Institute of Geography and Statistics (www.cidades.ibge.gov.br).

Figure 2. Employment in different sectors of CMD.

In general, the families who were resettled complain about the same problems. Although their new houses look much better than before, two complaints were recurrent in the interviews: the bad quality or lack of water and the destruction of community linkages. A woman stated:

“We used to pray together, but after the resettlement, it became difficult to travel the long distances to meet my friends.” (Interviewee number 6, 24th February 2016)

The destruction of community linkages is part of the company/government ‘fragmentation strategy’ (Becker and Pereira 2011b) to discourage resistance. The nice looking houses are also problematic,

according to the dwellers. Among the problems related by locals are that firewood stoves do not function as the smoke stays inside the houses, the houses are located far from public services, land is unproductive, and there is a lack of sewage systems.

One of the main reasons behind the transformations of the CMD region after the displacement of tourism was the influx of workers to the region during the mine's construction. According to the 2010 Census (<http://www.ibge.gov.br/cidadesat/topwindow.htm?1>, accessed in 22 July 2012.), CMD had a population of 17,908 inhabitants. From 2006 to 2012, the town received a floating population of 7,000 workers, largely men (Cidade e Alteridade 2015). The list of problems associated with this situation is huge, including a considerable increase in house rental prices, which forced part of the original population to leave the main district towards the periphery. The municipality has seen informal settlements mushroom in the outskirts of the main district, and in some cases the slums have invaded protected areas, as is the case with the Salão de Pedras Park. Commercial services, such as banks and markets became overwhelmed, leading to huge queues to access very simple services. After 2013, the floating population decreased to 2,000 people, but prices remained inflated. Health services were also near collapse with the population increase, but the main impact on the health sector described in the study was the increase in the number of teenage mothers. The study demonstrated that this is a common situation when small municipalities receive large-scale projects, due to an atmosphere of promise and good expectations. It concludes that the vulnerability of local teenagers increases when they get involved with temporary workers who have no social linkages to the place, which often leads to problems such as an unwanted early pregnancy, psychological and social damages and sexually transmitted diseases.

Finally the imposed modernization generated a divided society, formed by oppressed and oppressor, which is a manifestation of the destructive side of development, as described by Cowen and Shenton (2005). The society became divided between the outsiders who came to the region to work for the mining company and the original population. People from CMD blame the outsiders for the transformations that the Minas-Rio Project caused in

the town, while migrant workers do not make any effort to be accepted in the society. The migrant workers are also seen as dangerous, especially for the women (Cidade e Alteridade 2015). The local public prosecutor stated:

“They form a big group of people that are unknown to the communities. Most of them have no respect for the local society, ... due to the errant life they live, changing places. ...” (p. 75)

The relationship with high salary workers is also a distant one. This division can be illustrated, for instance, in the establishment of private schools for the children of the company’s employees, which are too expensive for the local communities. The large number of private medical clinics as well as the new expensive residential neighbourhoods built to attend the housing needs of mining company employees have also caused the same dividing effect.

Divisions caused by the imposition of modernization are also followed by violence in most cases (Escobar 1995). There is a close relationship between income inequality – a result of a divided society – and violent crimes (Fajnzylber, Lederman, and Loayza 2002). The number of crimes has risen considerably since 2006 in CMD. A study describes the increase in drug dealing, rape, homicides, theft and robbery, and traffic offenses (Cidade e Alteridade 2015). Two figures are striking: the increase in violent crimes from 50/100,000 inhabitants in 2000 to 250/100,000 in 2010; and the seizure of firearms, from 0 in 2005 to 400/100,000 inhabitants in 2010. Similar to most public services, public safety was also not prepared for the floating population and the violence that follows wealth expansion. A resettled farmer described the current situation:

“There are no reasons for my son to leave the house. It’s from house to school and from school straight to the house, and he watches TV the whole day. That’s it! We see only disgrace in the streets; there are no reasons to leave. We don’t feel safe inside the house, in the streets it is much worse.” (Interviewee N° 8, 24th February 2016)

There is no doubt that the Minas-Rio Project has not led to sustainable development in the CMD region. The economic growth brought more problems than solutions to the local communities. However, after the impacts of the Minas-Rio Project started to appear, a resistance movement emerged in the local communities, which demonstrates the development of consciousness and the consequent pursuit of freedom. The resistance attracted the attention of the press, politicians, green institutions and activists, causing the environmental licensing process to take eight years to be approved. But with regards to future generations, a central element of the concept of sustainable development, this new conscious and critical society, aware of their context, are now much more capable to create a better place for their children. Many issues will influence this process, but one of them is necessarily the new global market for iron ore. The ore prices have diminished over the last years putting the viability of the Minas-Rio Project and the consequent regional economic growth at risk. As argued previously, the oppressed, when free and conscious, can reframe development.

CONCLUSION

This chapter described the objectives of the UNESCO MAB Biosphere Reserves, which are not protected area in themselves, but learning regions for the production of knowledge on how to encourage human development and environmental protection. Sustainable development is a central concept to the biosphere reserves, and therefore its conceptualization was explored with a focus on the expansion of individuals' conscious freedoms, based on a postdisciplinary dialogue between economics and education: the capability approach (Sen 1999) and the concept of conscientization (Freire 1973; Freire 1970). A case study about the impacts of the replacement of tourism by mining in the Espinhaço Range Biosphere Reserve demonstrated how an imposed process of modernization/industrialization is harmful to both entrepreneurs and affected communities. Four broad impacts were described: collapse of the institutional arrangement established throughout time to promote a sustainable tourism programme, fast transformation from

a quiet place to a busy industrial site, temporary workers who established a floating population of 7,000 people in CMD and related consequences, and the creation of a divided society.

We conclude that the mining project neither contributed to the region's sustainable development nor was the former 'sustainable' tourism programme sustainable, according to our conceptualization of sustainable development. However, there is a growing perception among the communities affected by the mine that life during the tourism decade was better. The numerous concrete negative impacts and the violation of human rights that resulted from the establishment of the mine have generated a flourishing emergence of critical consciousness within the affected communities. The conscious people have rethought the process of pursuing their freedoms, developed a resistance movement and become a serious obstacle to the authoritarian imposition of the mining project in the region of CMD. Moreover, we expect that people's increased consciousness may contribute to future generations meeting their own needs when iron ore prices start to fall, which will compromise the very viability of the mine.

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Chapter 11

**TOURISM IN THE SURROUNDINGS
OF PROTECTED AREAS: THE OBSTACLES
TO SOCIAL-PRODUCTIVE INCLUSION**

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ABSTRACT

Tourism in protected areas is a phenomenon that represents physical and mental pleasure for visitors. They can have direct contact with nature and appreciate views in a territory different from their own. For the local community in turn it is a dynamic source of jobs and income. Then, the local population can be part of the activities comprising this production system, with either formal and/or informal jobs that can give them better livelihoods. Nevertheless, local traditional activities, such as family

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farming and small-scale fishing, have not been included in the strategies for developing tourism. The lack of value given to small scale local production is clear when we see, for example representatives of the touristic trade (inns, hotels and restaurants), import from the capital cities of their States products that are already abundant in their own municipalities. But why does this happen? In Brazil, mostly around protected areas, what can be seen is a scenario of social exclusion of craftsmen, small-scale fishermen and family farmers. This chapter presents the main results from studies about the obstacles of small farmers in reaching social-productive inclusion by tourism. These studies have taken place in the surroundings of two protected areas of Brazilian national parks: *Jericoacoara* National Park, in Ceará state, and *Lençóis Maranhenses* National Park, in Maranhão state. A set of nine factors were chosen and tested with business people and organized workers' groups. These factors relate to social-productive inclusion or exclusion defined from direct observation, preliminary interviews, and specialized literature. The results after the assessment show that on both locations the most important factors refer to guarantees in supply, productive sufficiency for meeting the demand, and technical and managerial capacity-building.

Keywords: social inclusion and exclusion, social-productive inclusion, sustainable tourism, national parks, local development and inclusiveness

INTRODUCTION

Tourism in regions surrounding protected areas is a dichotomy when it comes to the private interests of visitors and of the local community. First of all, tourism is a basic need for physical and mental recovery, when visitors can escape the congestion of large cities (Ruschmann 2006). Being able to encounter different settings – for direct contact with nature, with the history of a territory and with culture demonstrations – is what people seek as an essential element and as their right, calling it “leisure”, which includes entertainment, one of the human needs (Trigo 2002).

On the other hand, for the local community, tourism is translated into a dynamic source of jobs and income. It means an opportunity for broadening the local economy. So, the people of the places surrounding protected areas want to be involved in the several activities that are part of the productive

system, either through formal or informal jobs that can grant them improved livelihoods.

However, in many Brazilian touristic destinations, extreme poverty is present especially in rural and semi-urban zones. These areas are inhabited by groups of small producers and other groups who are in distant places, not only physically in the territory, but also mostly away from effective participation in the economic benefits of the “local tourism productive system” (LTPS).

The absence or ineffectiveness of public policies towards the strengthening and valuing of traditional productive activities (such as small-scale fishing and family farming), together with the lack of an integrated touristic system, have resulted in little capacity in these touristic destinations to improve the life conditions of its socially and economically vulnerable inhabitants.

When looking for economic opportunities through formal jobs, many rural dwellers are faced with a diversity of logistic obstacles, low wages, lack of labor rights and underemployment conditions. Others, when opting for free-lance and entrepreneurial works, end up providing tourism-related services in many cases without due qualifications, without formal papers (given the withholding of social levies and taxes) or security. A few of them also look for a job as salespeople, trying to sell crafts to visitors, mostly. But many are not successful.

Having mentioned the above, it is worth asking: which primary challenges inherent to the productive processes end up making it more difficult, or even preventing, that groups such as small farmers to be competitive in tourism and receive recognition and draw effective income from their activities?

We should reflect on the obstacles against the social-productive inclusion of groups of small farmers in the LTPS. The focus of this chapter is to present a summary of the main results of research from two regions surrounding two national parks: Lençóis Maranhenses National Park and Jericoacoara National Park. The intention is to contribute to the making of social inclusion public policies that are more effective and efficient for

channeling the economic benefits from tourism to socially and economically vulnerable dwellers.

This chapter is organized into four parts and we will mostly focus on the obstacles regarding direct sales of fish and agricultural products, emphasizing supply (family and small-scale production) and demand (hotels, inns, restaurants, beach kiosks, resorts etc.). In the first part, we will briefly present the regions under study, focusing on the protected areas. In the second, we will describe a few theoretical implications and the central issue. The third part deals with the methodology applied to studying the obstacles to social-productive inclusion and the tested factors. Finally, in the fourth topic we will present the main results.

SOCIAL AND ECONOMIC MISMATCHES IN REGIONS SURROUNDING BRAZILIAN NATIONAL PARKS

The National Park *Lençóis Maranhenses* - PNLM (Maranhão state) and *Jericoacoara* - Parnajeri (Ceará state) hold landscape singularities, featuring the natural exuberance of Brazil and the world. They are strictly protected areas, and they differ regarding their sizes, but they are similar regarding social and economic issues found in the regions surrounding them. PNLM is 155,000 hectares, whereas Parnajeri 8,850 hectares. Both are found along the Atlantic coast in a region called “Costa Norte”, a zone that cuts through the states of Maranhão, Ceará and Piauí, surrounded by other protected areas, and having tourism as one of the main sectors in the local economy.

These national parks have similar geomorphologic aspects. They present coastal plateaus, slightly uneven relief due to wind, sea and river forces, which create both large free (moving) and fixed fields of dunes. The PNLM has fresh water lagoons amidst the dunes, hundreds of them, different in sizes and depths; some are intermittent and other perennial, formed by intense rainfall and by outcropping of groundwater. These are the main

touristic attractions of this Protected Area. In *Jericoacoara* salt water lagoons are more frequent, featured by dips that flood as the tide advances.

PNLM has a main route of access via the municipality of Barreirinhas (269 km from the Capital of Maranhão state, São Luís), and it contains a touristic welcoming structure and is close to the most important visitation spots, such as the white dune field and perennial interdune lagoons. In turn, *Jericoacoara* National Park has a main gate located at the municipality called Jijoca de Jericoacoara (289 km from the capital of Ceará State, Fortaleza) and tourists come looking for “Vila de *Jericoacoara*”. It is a village at 18 km from the municipal headquarters, having the Park as a neighbor and with a welcome center, with hotels and other stay-over businesses, food and front desk services, aside from tour guide and jeep driver cooperatives and associations.

Between the 1980s and 1990s the flow of visitors increased dramatically because the humble routine of these places and paradise-like scenarios available to the public. Investors came and opened small, medium and large-sized businesses, which turned these municipalities into touristic centers, compared to other national and international places (Molina 2007). With that, traditional production activities, such as small-scale fishing and family farming (extraction of primary products, such as maize, rice, cassava, cashew etc.) were slowly left aside (Silva 2004).

According to the IBGE (2016), currently these municipalities' populations are, respectively, 19,224 and 61,621 persons. The Working Age Population (PEA) is 71.5% and 77.4%, but these individuals receive less than the minimum wage a month, respectively (IBGE 2013). Poverty rates are above 50% of the total population in both cities, 53.46% in Jijoca, and 57.65% in Barreirinhas (IBGE 2013). According to the UNDP (2016), income concentration is also high and Gini indexes are Barreirinhas (0.61) and Jijoca (0.59).

Municipal development rates - IFDM (Sistema Firjan 2016) reinforce the negative social and economic picture. Nonetheless, both regions differ in the ranges of development in which they were ranked in the last year of publication (2013). Barreirinhas reached a development index of 0.4488,

called “regular development”. Jijoca in turn reached a higher index (0.7414), which ranks it as “moderate development”, below the overall level for Brazil (0.7441). Between 2005 and 2013, among all components analyzed (health, education, employment and income) the latter (employment and income) rank the worst in the municipalities (Figure 1). In 2013, the component employment and income reached 0.2108 in Barreirinhas, classified as “low development”. In that same year, Jijoca de Jericoacoara did not go above 0.5804, remaining as “regular development”. Therefore, in order to reach better levels of local development in these touristic destinations, there should be strategies to foster the effective improvement of income levels for the traditional communities.

BARREIRINHAS – MA									
	2005	2006	2007	2008	2009	2010	2011	2012	2013
Total	0.3061	0.4078	0.4224	0.4919	0.5119	0.5191	0.4819	0.4794	0.4488
Education	0.4217	0.4141	0.5051	0.5063	0.5225	0.5253	0.5359	0.5430	0.5523
Health	0.3014	0.3954	0.5395	0.5795	0.5757	0.5524	0.4762	0.4793	0.5834
Employment and income	0.1953	0.4139	0.2226	0.3898	0.4376	0.4797	0.4335	0.4158	0.2108

JIJOCA DE JERICOACOARA – CE									
	2005	2006	2007	2008	2009	2010	2011	2012	2013
Total	0.5660	0.5794	0.5758	0.6361	0.6901	0.7289	0.7485	0.7512	0.7414
Education	0.5986	0.6025	0.6952	0.6851	0.7391	0.7673	0.8270	0.8484	0.8320
Health	0.5980	0.6181	0.6424	0.7360	0.8332	0.9160	0.9039	0.8606	0.8118
Employment and income	0.5013	0.5175	0.3898	0.4874	0.4978	0.5034	0.5147	0.5447	0.5804

Figure 1. IFDM progress in Barreirinhas (MA) and Jijoca de Jericoacoara (CE).
Source: the author, from *Sistema FIRJAN* (2016).

When we considered the Gross Domestic Product (GDP) at current prices, and the economic activities mostly developed in the two municipalities, the service sector appears the most. Given the environment potential and the natural attractions found in both regions, the service sector is headed by tourism as its main source of revenue. Their activities can be developed thanks to support services, such as agencies and operators, hotels and related businesses, transportation and trip cooperatives, restaurants and bars, aside from local product sales (cashew nuts, crafts, clothing) and manufacturing (small grocery stores) (ICMBio 2013; IBAMA/MMA 2013).

However, the dynamics of tourism has not only led to more jobs, employment and income. Influenced by the establishment of National Parks, tourism has also resulted in negative impacts such as: depletion of natural areas given the uncontrolled proliferation of equipment; increase in car traffic leaving spilled fuel and noise pollution; increase in the number of slums; lack of sewerage system; excess of waste not properly disposed; prostitution and drug dealing; less cultural demonstrations; low skilled labor; little participation of local communities in the economic benefits, leading to social exclusion situations (Tasso 2014).

INCLUSIVE AND EXCLUDING PERSPECTIVES IN THE PROCESS OF TOURISTIC DEVELOPMENT

In Brazil, the ecologically sustainable use of resources for the benefit of local communities should be part of an endogenous development strategy (Sachs 2002) as a stimulus to fight poverty and low development rates found in many touristic destinations. Nonetheless, many local development models, which count on tourism as a means to generate revenues, have features that go against endogenous development. These models are influenced by the concentration of wealth leading to investors that take over spaces and over explore them, excluding the local population.

Such tourism development models in regions with low human development indexes serve only for meeting visitor's demands and do not consider local needs. The comfort that is provided by megahotels and the external entrepreneur strategies of making the local reality invisible to visitors – keeping the tourists from encountering poverty or avoiding services provided by local groups –, are a few of the mechanisms used to disguise the problems of the destinations. The results are depicted in the low social indexes, in poverty and inequality (Sachs 2004).

The many conceptions and approaches that try to deepen the concept of social exclusion show the clear multidimensionality of the theory

(Rossavalon 1995; Nascimento 1994 and 2004). They comprise a rich variety of situations (Bouget 1992), a rupture of social, community, family or individual ties (Xiberras 1992) and a situation of not belonging, in which individuals are found simultaneously disconnected from the labor world and unattached to social life (Castel 1991). The loss of abilities and individual freedom (Sen 2000a) also come from social exclusion.

Apparently, the social exclusion scenario is strengthened by the uneven distribution of economic benefits derived from the tourism sector among local groups which makes many of these groups to remain in extreme poverty conditions.

However, the development goal would be to foster tourism by means of inclusive local development, thus ensuring the exercise of civil, civic and political-democratic rights for citizens. This stimulates exploring local potentialities (Sachs 2004). Development focusing on the improvement of the local population's quality of life, by stimulating self-management by residents preserve environmental heritage, promote the social and economic dynamic in the territory, strengthen local social organization, explore potentialities and expand freedom (Buarque 1999; Irving 2001; Sen 2000b) is the overall goal.

Creating this development dynamic is the main challenge to overcome the barrier of social exclusion in touristic destinations, an obstacle for policy-making in Brazil.

Discussion on the factors of tourism inclusion is very relevant for policy-making to tackle social exclusion. Since there is little specific knowledge on the factors that influence the insertion of people from touristic destinations in the productive system sector, government programs end up not being very effective. With this in mind, the object of discussion in this chapter is important. Despite all the investments towards poverty eradication and social inclusion in Brazil, increases in productive capacity and insertion of products in the market (through technical support and offering of inputs (Brasil 2012)) anticipated increases have not yet occurred. This takes time and must take into account the scenario of high social and economic vulnerability among rural community groups.

METHODOLOGY AND FACTORS FOR SOCIAL-PRODUCTIVE INCLUSION

We use general information gathering techniques, and specific data collection, by means of two approaches: (a) exploratory, *in situ* observation, document assessment, literature review, and interviewing key-players; (b) qualitative, with the application of forms and interviews, unstructured and semi structured, with tourism business people and Organized Worker's Local Groups (OWLG).

In order to systematize and analyze the qualitative data, we have used description analysis, with the comparison of the results obtained with forms and interviews with tourism business people and the OWLGs. As suggested by Ragin (1987) and Becker (1999), the results allow classifying each factor tested according to their level of contribution to the social-productive inclusion in the LTPS. This is the criterion for classifying the factors:

- High likelihood: factors with assessments at or above 61% of mentioning by interviewees, with indications of clear contribution in the social-productive inclusion processes;
- Uncertain: factors with assessments between 31% and 60% mentioned by interviewees, which shows some influence in the processes of inclusion, and reinforces the need of delving further;
- Disposed: factors that have received assessments lower than 31% by interviewees, which does not show significant contribution to social-productive inclusion processes.

Hence, it was possible to classify the factors for their relevance, among those who consume products (demand), and those who offer them (supply).

Social-productive inclusion factors were the basis of this research and were defined according to the multiple features that could contribute for an individual or a group to be able to be competitive in the touristic market, offering its products or services directly to the business sector. Some of the factors listed had already been highlighted in technical papers and previous

studies (ISPN 2011; Capellesso and Cazella 2013; Merjin 1989; Vinh 2013; Brasil 2011; IABS 2008), as hurdles for direct sales of products by small-scale or family groups. Direct inclusion factors (social-productive inclusion) defined are the ones shown in Table 1.

Table 1. Social-productive inclusion factors. Source: Tasso 2014

Invoicing: especially the resorts require invoices by service providers so they can make a sale. This can be a limiting factor for direct sales with small local producers.

Payment conditions: the subsectors of large hotel chains in charge of the orders, stock control, payment and obligations (financial), end up requiring time for payment and it can only be done through bank transfer, what makes it harder to sell.

Adaptation of production to tourism seasonality (frequency of supply): mismatch between seasonality of tourism, fishing and regional fruit production, may be another obstacle for social-productive inclusion. High tourist season periods sometimes coincide with off-season fishing periods or droughts in plantations. So, there is no guarantee in the frequency of supply (all year long).

Working capital, processing structure and storage facilities: the absence of an economic base that can cover production costs is a reality for small producers. As well, the business sector prefers to purchase processed products, which require physical structures with proper equipment. In order to store the processed product or preserve seasonal products, they need suitable places for storage that can keep the quality of the products.

Sufficiency of production to meet the demand (amount in demand): providing the amount necessary and maintaining the standard are requirements difficult to meet by small producers.

Logistical availability for distributing production: the lack of transportation means with enough space for storage and able of distributing the products is also an obstacle.

Technical and managerial capacity-building: lack of technical know-how for processing products and best manufacturing practices and personal hygiene, together with poor management of the production, expenditures and stocks.

Collective organization of the work: this is an essentially cultural obstacle and eventually political, such as decisions made without a significant number of cooperate members, lack of effective participation in technical courses, lack of consensus in aspects inherent to labor and the implementation of projects for strengthening the production.

Certification of products with sanitary inspection stamps (SIF / SIE / SIM): the SIF is a national system for assessment and control of food production, edible or not, animal origin, implemented by the Ministry of Agriculture, Livestock and Supply in Brazil. The demands to reach a quality standard for the stamp are sometimes above the capacity of the small producers.

In Barreirinhas, 43 touristic establishments were reached and nine organized workers' groups (such as associations and cooperatives of family farmers, small-scale fishermen, craftworkers etc.), were randomly selected given the information provided by local tourism departments. In Jijoca, 56 touristic establishments and nine organized groups were interviewed.

RESULTS

Origin of the Products Consumed by the Business Sector

The data from the forms and interviews, together with interviews with the representatives of the business sector, have shown that most of the products consumed by the establishments, except crafts, come from outside the municipalities.

Most business people interviewed from Barreirinhas (83.3%) and Jijoca de Jericoacoara (80.7%) have reported the fruit sold in their establishments are imported from other regions, even when they are abundant in the municipalities. Vegetables from outside the local area are offered by most establishments interviewed (62.5% in Barreirinhas and 73.3% in Jijoca). In the interviews recognized that many of these agricultural products – such as tomato, orange, pineapple, onion, banana and bell pepper – are distributed from Serra do Tianguá (Ceará) production center to be offered to small grocery stores and tourism businesses.

In the case of fish products, abundant in the two regions, the picture is the same. In the establishments included in the research, most of them (55.6% in Jijoca and 37.5% in Barreirinhas) buy fish from outside the municipality. Usually, the main suppliers are the large markets located in the capital cities of their respective States. With beef it is the same. 41.7% of the interviewees in Maranhao and 100% of the interviewees in Ceará have mentioned it. But, few crafts are imported from other regions. In Barreirinhas, 77.8% are from locals. In Jijoca it is different because over 40% come from other places.

Different Factors Presented by Interviewees

When asked about what would be the factors that influence the acquisition of products, interviewees' answers were homogenous. Business people from Maranhão and Ceará both mentioned most frequently, the "quality/freshness of the product" (56.5% and 39.8%, respectively) and the "price" (14.5% and 27.8%, respectively).

In turn, in the organized groups, they mentioned most frequently two factors that harm the sales of products directly sold to the local tourism business people: (1) lack of (financial) incentive by public authorities, and (2) competition with "outlaw" service providers, both reaching 16.1% in Barreirinhas and 19.2% in Jijoca.

According to respondents, there is a vicious cycle in which profits they make along the activities is not enough to pay for the expenses from production and taxes. Apparently, to become a formal provider and be in the market with proper services, it is financially unfeasible due to a lack of incentive and interest on the part of local public managers who, in their own words, do not oversee strictly those outlaws and do not concretely support the formal ones.

Specific Factors Assessed by Interviewees

Frequency of Supply (Seasonality)

This factor was highlighted among business people in Barreirinhas (62.8%) and Jericoacoara (78.6%), classified as high likelihood. The OWLGs mentioned it as a primary aspect in the process of insertion of their products in the touristic market. According to them, the lack of typical fruits and certain fish species during given times of the year either because of natural seasonality, of low production or even the off-season periods, all lead to a situation where small producer cannot guarantee the continuous supply of such products. In this case, business people end up purchasing from the capital cities, which can ensure continuous supply during the whole year.

Sufficiency of Production for Meeting the Demand

Among the assessments presented by the business people, such factor was ranked as *uncertain* in Barreirinhas (46.5%), and *high likelihood* in Jijoca de Jericoacoara (78.6%). For small-scale production groups working with traditional techniques, they are often unable to meet the requirements of the business people, and if they do, accelerating the process ends up compromising the quality standards maintenance.

Technical and Managerial Capacity-Building

Jijoca (57.1%) and Barreirinhas (41.9%) business people ranked them similarly, as *uncertain*. Among the OWLGs, lack of technical and managerial capacity-building was seen as an obstacle to social-productive inclusion, considering the requirement of the demand, business people who want high-quality products and security and hygiene in production processes. The lack of training may directly compromise the proper management of the production process, making it an issue for increasing competitiveness.

Logistical Availability for Distributing Production

This factor was *uncertain* in Barreirinhas (44.2%) and *high likelihood* in Jijoca (80.4%) OWLGs from Jericoacoara need to use a resistant 4-wheel drive, because the dune field of the Park makes it harder to go to the municipal headquarters, 18 km away. In Barreirinhas there are no impediments of this type.

Certification of Products with Sanitary Inspection Stamps (SIF/SIE/SIM)

Was classified in Barreirinhas (46.5%) and Jijoca (57.1%) as *uncertain* by the business sector, and was not cited by OWLGs. Apparently, sanitary certifications – federal, state or municipal – are not an impediment for the local trade.

Collective Organization of the Work

The business people in Barreirinhas (23.3%) and Jijoca (21.4%), classified it as *disposed*. But OWLGs in Jericoacoara reinforced this factor strengthening the productive process, and helping to mitigate situational issues and then influences the social-productive inclusion.

Payment Conditions

In Barreirinhas (30.2%) the factor was *disposed* and in Jijoca (37.5%) it was considered *uncertain*. Such difference can be explained by a bigger number of large-sized establishments in Jericoacoara.

Working Capital, Processing Structure and Storage Facilities

Disposed by the business people of Barreirinhas (23.3%) and Jijoca de Jericoacoara (23.2%), for social-productive inclusion.

Invoicing

Disposed in the two locations, receiving a low grade in Barreirinhas (30.2%) and Jericoacoara (30.4%) by the tourism business people. The OWLGs have mentioned that, in spite of the importance, the invoice has not been an impediment to social-productive inclusion.

CONCLUSION

The level of sustainable local development advocated by Sachs and others does necessarily imply social inclusion, i.e., minimum income equity among the population. In the case of a touristic destination, the social economic inclusion is indispensable in the productive system. It is an inclusion process that can be effective through formal jobs (direct inclusion), or through sales of local produce (indirect inclusion) (Tasso 2014). Here we have analyzed this second possibility, called social-productive inclusion, which encompasses overall small producers, such as small-scale fishermen and family farmers.

This inclusion can only be effective if the touristic trade in all its protected areas starts consuming more of the local products. This can be the best and easiest way to distribute income and contribute for sustainable development. First, because local consumption generates income to local producers, stimulates community-based production and improves productivity and, consequently, competitiveness. Secondly, because by minimizing the displacement of products, human lives are protected (in Brazil road accidents account for over 50 thousand deaths yearly) and less CO₂ is emitted.

Finally, since in all touristic destinations there are local products – usually not very much developed – if they are stimulated by the touristic trade demand, it can help them to develop. This tends to lead to a virtuous cycle of production and productivity improvement, better trained people, better productive processes, income increase and social participation and community engagement, because it demands cooperation among producers.

When destinations are self-sufficient, they use all local productive potentialities, so this is a goal that can provide the conditions to sustainable local development. Of course, this includes all the nuances of inclusion that are part of a greater concept of sustainability.

The results have shown that the factors tested herein are either considered very relevant or not relevant at all, depending on the peculiarities of each of the two places.

In general terms, the classification of the factors tested has shown that one especially was most likely in both municipalities: regular supply. The business sector is concerned that it will receive the products they need in the required quality standards and with a defined frequency. Therefore, this factor was mentioned as the most relevant among hotel and restaurant owners etc.

After all availability of food is necessary for the good provision of their services and good care of the customers. Business owners also mentioned during the interviews they buy inputs from different places because local producers do not give guarantees to provide the goods when they need them. According to the interviewees of the OWLGs, the local production is very

small in scale and the supply of products depends upon seasonality and variable climate conditions.

Two other factors (productive sufficiency and logistical availability) have been classified as uncertain in Barreirinhas, and high likelihood in Jijoca. The business sector is worried about getting the volume of products they need, and the lack of large scale mechanisms for OWLGs is also an obstacle to social-productive inclusion. Individually speaking, the logistical availability has been considered relevant in Jijoca de Jericoacoara because developments are found inside the Park, far from the municipal headquarters (18 km), what is not the case in Barreirinhas where the headquarters of the *Lençóis Maranhenses* National Park is found. Logistical limitations among the OWLGs for distributing the production pose structural and operational barriers.

The factor ‘payment conditions’ was also classified differently in both locations. In Barreirinhas it was not considered and in Jijoca it was uncertain, given the larger number of large-sized establishments in the municipality of Ceará. Invoicing and payment processes demanding more time for payment and/or requiring banking systems, which most OWLGs do not have.

The factors ‘technical and managerial capacity-building’ have been classified as uncertain in both places. It should be noted it is strictly related to the actual provision of training and whether the training is guaranteed to happen. Overall, having an adequate scenario of organization, processing and best manufacturing practices, management of productive processes and security of supply can give the business sector the needed environment for doing business.

The ‘certification’ factor was not mentioned frequently among business people, although it was slightly more relevant in Jericoacoara. This is understood because certification is essential in places whose consumers are very demanding.

For the factors of interest to the business sector (collective organization of the work, invoicing and working capital, processing structure and storage facilities), there were different views among the OWLGs. Particularly, the collective organization of the work, which was considered extremely

relevant for fishermen and farmers, because cooperatives and associations may back up when one individual cannot supply, ensuring the client will have the product needed. OWLGs also mentioned that in order to become more competitive in the marketplace they need to further develop their production models, so that they can add value to their products. Given that, the lack of working capital and processing structures and storage facilities is a challenge, which has not been overcome to date.

It is odd that the factor 'invoicing' has not been expressly assessed by the business sector, as if the presence of the State was less significant, because only in these cases an invoice has no importance, given the frailty of the tax authority. But once again the business people in Jericoacoara ranked it as a bit more important, which shows a greater presence of the State. This is confirmed when they assessed the factor 'payment conditions', dispensed in Barreirinhas and uncertain in Jericoacoara.

The incidence of the factors selected in the process of social-productive inclusion should be the basis for social inclusion public policies in touristic destinations. If the State acts in helping with policies, there can be a more propitious environment for increasing production and guaranteeing frequency and, above all, guaranteeing productivity, which will lead to more competitiveness.

When trying to be more effective and efficacious, social-productive inclusion public policies for the local tourism system should at first look for strategies, which can provide:

- a) technical support, that leads to capacity-building and professional qualification of OWLGs, and that it is a guide regarding the commitment to maintaining the quality of the products and guaranteeing frequency in the supply of the goods;
- b) logistical support, which can help distributing the goods of the OWLGs to the business sector;
- c) Better structuring of collective spaces of production, whether it is for new equipment, or even availability of working capital. So, the OWLGs may have more productivity, aimed at reaching productive

sufficiency as the demand may be (always concerned with prudence and respect to environmental limits);

- d) raising awareness among the touristic trade regarding the need to encourage the OWLGs by buying their community-based products (even if not all of them), as a social matching action, thus respecting productive seasonality and fostering participation and local productive development;

After all this is what we mean - having a competitive and valued local production in touristic destinations, but above all with guarantee of supply. This is something that does not happen spontaneously, but slowly and with intelligent support from the State. This is one of the situations in which an intelligent presence of the State, and not a protectionist one, may lead to efficient social-productive inclusion results.

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Chapter 12

**COMMON SENSE IN TOURISM AMONG RIO
NEGRO SUSTAINABLE DEVELOPMENT
RESERVE RESIDENTS**

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ABSTRACT

The goal of this chapter is to identify and assess the social representations of tourism among the residents of the communities Nossa Senhora do Perpétuo Socorro and São Thomé in Amazonas state, within the limits of *Reserva de Desenvolvimento Sustentável Rio Negro* – Rio Negro Sustainable Development Reserve. In the past 20 years, this microregion has faced rapid urban growth, increase in infrastructure and has been included in the Metropolitan Region of Manaus. With these changes, tourism has been expanding fast and has become a significant economic activity.

In this context, we see the host communities become spaces for exploring tourism, although there had already been developments done by a few community members and public investments towards tourism. In this chapter, the analysis was centered around the different traditions of how social science is studied, within the papers on social representations as originally proposed by Moscovici (2012) and, later on, by other authors. The research is qualitative and uses many methods, integrating different elements such as observations, individual interview, cognitive map and focus groups.

The set of techniques has made it possible to identify the knowledge of community dwellers through communication backed up by the social representations. These representations have been divided into 3 categories of local agents, for they are frequently present in their discourse: place (territory of experiences), tourism and institutions supporting tourism. Results point out to different social representations, formed and transformed from each reality and social group. Nossa Senhora do Perpétuo Socorro is more politically consolidated, and having a protected area is a foundation for a sustainable form of tourism, as the population believes. In São Thomé, local agents share the same viewpoint.

There are similarities when social representations are formed: concerning the place, because it means belonging to the host communities; regarding tourism, in which dwellers see it as an important income-generation activity; and the existing institutions that support tourism, for they must reinforce their presence towards overcoming the conflicting situation between the public authority and the host communities.

Keywords: social representations, communities, community-based tourism, protected areas, Amazon

INTRODUCTION

In this chapter, knowledge is produced through interaction and communication, emerging from the rural world, where men and women meet and interact in the community space. This chapter is an invitation for reflection and an understanding about the reality of the “other” in the daily life.

Choosing the social representation field of study makes it possible to note and understand beyond what is around us. We can notice the world of the “other” by means of their conceptions and tension points in their culture. All the knowledge produced is the product of a specific group of people, with distinct subjectivities live well together and produce social representations, many times under the light of consensus. Representations are seen as a dynamic that has the power to inform decisions, knowledge, feelings, values and hopes about tourism. These representations are dynamic and transform giving rise to others, emerging from the communicative action of the dwellers in each of the communities in the study.

Tourism and its web of relations is the focus of this chapter, but it is an interdisciplinary area, so we delved into the Theory of Social Representations – TRS (sensu Moscovici 2012), under the social and psychological mainstream theory. Even with a considerable amount of national and international references written in the last few years, in the Amazon there is a clear lack of studies on social representation, as an instrument for understanding tourism and community-based tourism. This is perceived in small locations in inner Amazonas state, where the dynamic and the effects of tourism management are little understood or even ignored.

Durkheim (1858-1817) used the concept of representation in social science to make a difference between individual and collective representations. Taking this opposition almost radically, we tried to build a sociological object, separating it from psychology and biology. Farr (2004)

is certain this is how Durkheim built the knowledge of sociology, by putting the focus on the collectiveness and ignoring the individual; leaving the study of collective representations to social scientists and individual representations to psychologists.

Following a tradition by Durkheim, Moscovici (2012) introduced the concept of social representations in 1961, connecting it to a social and psychological approach current with the work *La Psicanalyse: son image et son public*. The concept originated in Sociology, Psychology and Anthropology by trying to understand how the social and the individual intertwine, crosscut, but do not separate.

Hence, the concept of social representations reaches Moscovici from Durkheim and according to Moscovici himself “we have a different view from him” (Moscovici 2011, 45) as he notes: “Durkheim, faithful to the traditions of Aristotle and Kant, has a quite static conception of these representations” (Moscovici 2011, 47). In this perspective, Moscovici is integrated into our study when considering representations as phenomena that need to be explained, and described, as dynamic structures. “These are specific phenomena related to a special way of understanding and communicating – a way that creates both the reality and the common sense” (2011, 49).

Rural communities are the object of this chapter and they are located in Iranduba, a municipality that has been going through deep socio-spatial transformations in the last few years, as a result of the construction of the *Rio Negro Bridge*, over the Negro river connecting Iranduba to Manaus. Hence, the researchers identified and analyzed the many representations that emerge from the community members through their social relations among the collectivity.

With the above stated, we ask: what are the social representations on tourism undertaken by the different social groups in the communities under study? Is community-based tourism seen as an alternative livelihood by the communities?

HOW THE STUDY WAS FORMED

In the Amazon, the political organization of the communities Nossa Senhora do Perpétuo Socorro and São Thomé began in the 1970's, with the *Movimento de Educação de Base* (MEB – Basic Education Movement), under the *Conferência Nacional dos Bispos do Brasil* (CNBB – National Bishop Conference in Brazil). Given the scope and care provided by the MEB to rural populations, clearly influenced by the Catholic Church, local communities began in this context.

With the constant presence of the church, they started as *Comunidades Eclesiais de Base* (CEBs - Basic Ecclesiastics Communities). They were called communities because they gathered the people from the same church and region, motivated by faith; they were ecclesiastical because they formed a center of faith at the church; and they were basic because they gathered members of lower-income classes: housewives, workers, retirees, youth, small business owners, homesteaders, farm workers, etc.

The CEBs were created in the Amazon in 1972, in Prelazia de Tefé (a municipality in inner Amazonas state) and then expanded to other parts of the region. The missionary method was transferred to pastoral agents and to riverine communities. In Tefé and other Amazonas municipalities, a form of organization was created, both social and political; whose volunteer work of the riverine population supported the construction of community structures, such as schools, houses and soccer fields (Neves 2006).

The riverine have become catequists, community leaders and animators, they took good manners and hygiene courses, as well as courses on community structure, associativism, leadership and others. The parochial headquarters was supervised by the riverine populations (Neves 2006). Community members were named like that because they dwelled in the communities and whoever adhered to the religious system would also reach positions such as: monitor, rapporteur, community council member, sports director, a juridirector (collective stewardship effort), catequist, Sunday cult director, and sanitation expert.

Social players, identified as the riverine, are the beholders of social and historic knowledge, which determine their livelihoods within the communities. The origins of these communities date back from a long regional process, also influenced by the social and cultural organization of the indigenous populations in the villages. The indigenous heritage gave the riverine a solid cultural structure, even given the impositions of the livelihoods of other cultures. In this chapter, we use the terminology riverine or community members, for those residing in these communities. They also use these terms for themselves.

On the other hand, a driver for having more riverine populations together in communities was the climax of latex-producing activities after the loss of the rubber market to Asia, in the end of 19th century and the first twenty years of the 20th.

In the lower Negro river, the location for the study reported in this chapter, besides farmers, fishermen and extraction workers from inland, the riverine, as a complement, included craftworkers and small entrepreneurs (owners of inns that receive tourists).

The current forms of social and political organization of the riverine in communities have varied according to the regional context, i.e., they have organized themselves influenced not only by the indigenous or by latex-producers, but also by the intervention of the Catholic Church. The latter has encouraged the riverine to prioritize living as a collectivity, grouping themselves in rural communities.

ACAJATUBA COMMUNITIES

The community Nossa Senhora do Perpétuo Socorro is mostly known as Vila do Acajatuba, is located in a region influenced by the Negro river, in Acajatuba Lake. Just as with many communities in the Amazon, it was founded by the Catholic Church, particularly the MEB.

Vila do Acajatuba was officially established in 1976, but people have been living there for generations. The first residents would live off the resources from the extraction of timber and the production of coal. Travel to

Manaus was quite difficult, and done only with row boats or small vessels. Currently, there are 66 domestic-family groups (some blood-related, some not) in the community, for a total of 239 dwellers. The lands they occupy do not have a final deed of ownership, the State offered them a concession to use because it is a protected area.

Regarding the infrastructure in the community, there is a health clinic, a municipal school, a community center, a soccer field, four churches, a well, electricity since 2007, two snack shops, a bar and the Vista do Lago Restaurant. In the local shops, people can buy food, beverages, cleaning materials, clothes and accessories. Regarding communication, there is a community voice (speaker service done by the community for the community, disseminating day-to-day information, messages, songs, different announcements) and two mobile phone operators, with mobile and rural phones working. Internet has also become more accessible, and with it, the residents have more and more contact with social media. Physical access to the community is done by land and river.

There is a craft shop, a touristic boat terminal and a community inn, with investments from the Ministry of Tourism and the governmental Amazonas state tourism agency (Amazonastur). The community space also shelters the dwellers' association and the Japiim Group Sustainable Craftworks Association. The latter has been attracting visitation in the community for over thirty years through the production and sales of craftworks.

In most Amazon rural areas, schools, church, and health clinic are places where people gather (Wiggers 2012).

São Thomé is 20 minutes away from Vila do Acajatuba and was officially established in 1982, but there were people living there before that until they gathered in communities. After the school was built, together with the small wooden church and the soccer field, the first houses appeared over the land.

In terms of spatial organization, the headquarters of the community is at the left margin of Acajatuba Lake, and people live in floating houses close by. Nowadays there are 54 domestic-family groups with a total of 226 people. The central point of the study is the Vila, as they call it, where there's

circulation of visitors. In the Vila, there are 13 domestic-family groups, with about 26 dwellers.

In relation to social goods and services, there is no health clinic in São Thomé. For the worst cases, when there is a risk of death, the patient is moved to Manacapuru or even Manaus. When it is a simpler case, residents go to the health clinic in Vila do Acajatuba. There is a well, electricity since 2010, a community Center and a municipal school.

The community space also has a snack bar, a craft shop, two shops that sell beverages and processed food. There is a restaurant and a small inn with four rooms. There is a second inn, older and more famous, *Pousada do Jacaré*. The latter was established in 2005 with four rooms. Currently, there are 40 beds and 18 rooms. There is a touristic boat terminal, which was open with resources from Amazonastur, but it has been underutilized.

In 2010, a Globo TV show contributed to change the face of tourism in that community. A local tour guide sent a letter to a very popular national television program called “*Caldeirão do Huck*, where he requested an intervention in the inn so that all dwellers would benefit from it. After the program, there were changes in the local infrastructure and among community members.

The subjects of the research are residents of both communities located in the borders of the Protected Area: Vila do Acajatuba and São Thomé are located in the Sustainable Reserv Rio Negro (*RDS - Reserva de Desenvolvimento Sustentável*). Even if the territorial space is the same, the relation they hold with the environment and the context they are inserted is somewhat a different one resulting from different understandings about tourism.

MATERIALS AND METHODS

Representation phenomena can be found in the culture, in the social practice, in institutions, in the various forms of communication, but are in constant movement and it is only possible to change them into research objects with a theory that can organize them and make them more clear and

objective: The Social Representation Theory (TRS). The social representations of community members act as “theories” about the population know-how and common sense, being elaborated and shared collectively. Hence, the touristic phenomenon is simplified, organized and understood for this research.

The theoretical perspective of social representations has been applied in studies related to tourism, mostly since 1996. Various authors have discussed how this theoretical framework has developed and then have used it to understand the relationship between community and tourism. Ever since then, TRS has been used to analyze the behavior of the community and offer perspectives on tourism development (Ryan et al. 1998; Cave et al. 2003).

Individuals use symbolic and cultural elements define the daily reality understood for them and others, with whom they share their space. When identifying and analyzing social representations of communities, one should be aware of all interactions, relations and cultural processes taking place marked by the social context in which they are found. Hence, a series of methods and techniques were used to reach the objective of the study.

Field research was done between 2012 and 2015. In Vila do Acajatuba, these were the procedures and techniques: 10 field visits; 6 interviews with local agents; one focus group with 8 residents; and cognitive maps with 9 participants. In São Thomé: 9 field visits; 6 interviews with local agents; 2 focus groups with the participation of 3 and 5 residents, respectively; and the elaboration of cognitive maps with 8 participants. We chose not to identify interviewees to maintain their confidentiality.

The strategy to select the residents was similar in both communities, done according to the indication of the very participants, one would refer the other by using a non-probabilistic method, similar to *snowball* sampling process (Apolinário 2006). The intention was to make the referrals of the first participants in the study into convincing other members to participate.

A field logbook was used to record events of interest, such as: political-organizational activities (meetings in the dwellers’ association), informal talks, ceremonies, talks, habits, costumes, practices and touristic visitation. After gathering all those data, we organized the materials with the transcription of the interviews and talks. Then, we listened to all the material

recorded and then watched all the videos, in order to classify the data. After these stages, we made a final analysis, coordinating the data and the theory for the research.

The research also included secondary sources, with journals and several other scientific publications, as well as documents and reports so that the questions were well dimensioned. During all research stages, we considered the characteristics of the discourse for the data analysis and interpretation, because contradictory versions, subtle details such as hesitations, rhetoric, lapses, and discourse organization have all been recorded and assessed. In sum, the interpretation of the results had the context as the connecting link for the process, which requires a continuous reflection by the researcher and a dynamic interaction between him/her and the object of study (Günther 2006).

RESULTS

The focus group was carried out with the objective of identifying the social representations of tourism through the opinions and values present among the participants of the discussion group. The word hospitality is implied in the talks of the Vila do Acajatuba focus group's participants. According to Camargo (2007) there are two paradigms that can serve as a basis to study tourism, and likewise, there are two different positions to study hospitality: the perspective based on the business system and the one structured in the understanding of hospitality as a gift (Martins 2002; Caillé 2003). One of the interviewees mentioned the "place," the importance of visitors from "inside" and "outside" and how they like to "receive" any visitor without distinction whether it is a "fisherman," a "PhD" or a "tourist." What matters in this relationship is to welcome whoever is arriving and take care of them the best way possible, i.e., the representations point to the importance of human interaction. Under the perspective of "place," dwellers cannot leave where they were born, and Vila do Acajatuba represents affection, security and calmness.

We notice that the relationship between visitors and hosts, especially in Vila do Acajatuba, is ephemeral and superficial: “whenever they come here they party for about two hours and it is good.” Another community member, as they call themselves, states: “people come, but not all the time.” “They buy beer, a souvenir and encourage us.” The interviewee refers to visitors around the community and when they say it is “good,” we notice that although they stay for little time, their contact is seen positively.

Aside from the ephemeral contact of visitation depicted in the interviews with community members, we notice that although they are aware of the economic and social benefits from their visitors’ presence in the community, what matters the most is that at the end of the trip they do not stay overnight: “that is good, they get here [in the community], visit me, buy some stuff and then leave. I like this kind of tourism.” According to the interviewee, there is no interest in having visitors stay over, visits are leisure and should happen, but the space belongs to the community and it seeks taking ownership of it, thus establishing a very limited border: they get here, they walk around, they buy, they go.

We see in the representations that tourism is not only simply visiting the community, but an economic activity that for three decades has been contributing to complement the income of the families involved, mostly with crafts as noted by one subject: “today tourism brings and adds to everything we have, our food, our livelihood. Everything we have can be complemented by tourism, to me, to my children and too many people that work here with us.” Tourism and leisure are seen as synonyms for the interviewees.

In São Thomé in 2005, the inn *Pousada Jacaré* was built in the hope that visitors could stay overnight in the community, stay longer and leave some cash to small businesses. The inn is an initiative of a former employee of a hotel that used to be located amidst the forest in the lower Negro River zone. Even without schooling, he chose to be an entrepreneur in tourism hoping the activity could contribute to improving his livelihood. But until 2010, visitors only walked around the community, took a stroll, bought crafts and moved on. They would come with hotel tour deals, or through travel agencies and “would not leave a dime at the community.” Hence, the group that worked with tourism in São Thomé realized they were part of a

“sightseeing tourism” (Barreto 2004) and included new elements, new explanations related to it and, following the new reality, they changed their social representation.

In December 2010, according to the community members, the flow of tourists improved very much after a show from Globo TV. The program was shown nationwide and many visitors came to visit the community and its transformations, such as: renovation of the inn, the houses have been painted; the headquarters was renovated and received furniture. The welcoming agencies and hotels and inns in the surroundings also included the community as an almost mandatory visit.

But, based on the field research (focus group), we noticed the “conflicts” in the community, which became a recurring word in their speeches and started when they invested in the inn, because it was private money invested in the community space. Community members understand the improvement of their life conditions should be for “all” and not just to one family, which “benefited” by the renovation of the inn because of the TV show. According to one of the interviewees, dwellers believe they would play a key role in their space, what would feature community-based tourism, but it was not what happened.

During the focus group, many issues regarding the relationship of community members were mentioned, but these social agents see tourism positively, even if they are still concerned that almost no benefit is left when tourists leave and solid waste is produced during the visit. Tourism in the community is highly influenced by an external agent, i.e., tour operators.

But, there is a consensus: the community is a place of affection and strong social bonds. All dwellers interviewed do not hesitate in remaining in the community because they are there to stay, it grants them identity, and they wish to remain relating to that environment.

Nonetheless, social agents in São Thomé are almost invisible to the eyes of institutions supporting tourism. There are no significant investments, continuity of actions and strengthening of small businesses. Vila do Acajatuba subjects keep a distance from the state tourism agency and consider it inefficient.

In both communities, visitors are seen as a gift, but in opposition they are also a source of revenue. The logic of give-receive-payback, hospitality as a gift, is replaced by trade (Camargo 2007). In this trade whoever gains less (or nothing) is the community, anxious to receive economic benefits and the following improvement in their quality of life. Communities also hope a greater partnership from the state tourism agency.

In general, it is worth mentioning social representations of tourism in both Vilas are supported by reference systems that classify it as an economic activity of importance to their members. Tourism complements their income.

Even if they do not declare their income, in Acajatuba about five family groups are directly benefited from craftworks and tourism. In São Thomé there are four groups. Sporadically, as the need may be, a few dwellers are hired in the community to help with tourism activities.

DISCUSSION

In social representations of tourism, Vila do Acajatuba members do see hospitality as a gift. The gift is a highlight in Anthropology books as referenced in the book by Marcel Mauss (1950) called *Sociologia e Antropologia (Sociology and Anthropology)*, in which he wrote *Ensaio sobre a dádiva (Essay about the gift)*.

Community members show much interest in receiving visitors to Vila do Acajatuba and say they like doing it. The Maussian perspective makes it possible for hosts to be considered major agents when welcoming visitors, which are also, key players along the process. Dialectically, tourism is also a trading activity and as an economic activity it should draw revenue. But, other than in business relations, tourism makes it possible for community members to learn about other cultures and experience human interaction, a quite significant benefit for all interviewees.

In the field research, we noticed interviewees being stewards of tourism, true enthusiasts and who can mobilize the group to develop their works.

They are prepared to welcome visitors, but with the perception of the good and the bad in tourism. Some believe that direct contact with the host communities may lead to introducing new ideas, values and lifestyles and new stimuli for economic and social development (Todaro 1997). But, regarding the positive effects of tourism, the show-off effect, when tourists are examples to local residents, which are stimulated to adopt unknown, or before, inaccessible habits- cannot be overlooked.

Craftwork production is what drives community members to keep working and attracting visitors, because tourism is “everything” for them. Hence, we see that when subjects try hard to understand and make sense in the world, they also do it with feelings, emotions and passion. (Guareschi and Jovchelovitch 2011, 19).

In São Thomé we notice pessimism regarding tourism in contrast to Vila do Acajatuba. Interviewees showed concern with the future of tourism and were affected by the lack of integration of community members. Since the social representation is an organized corpus of knowledge (Moscovici 2012), people may react differently regarding tourism and it serves as an indicator for the social actions of the groups. Tourism excluding local people is a common theme in these communities, but they are trying very hard to overcome these issues, improving services and increasing the number of visitors. So, two new structures were built, an inn and a restaurant in order to foster local tourism.

Moscovici (2012) says that in a simplified way the propositions, reactions and assessments of representations are organized differently in each social class, culture or group, creating different realms of opinion. Social representations of social agents in both communities are close at the moment when interviewees consider tourism an income generating activity, with a possibility to contribute for the improvement of their livelihoods. But it is clear that the communities under study seem not to be outspoken enough to ensure an experience of community-based tourism, given the many difficulties they find in their spaces. They are strongly dependent in the hotels surrounding them and on the travel agencies. Community-based tourism is not definitive yet. In Coelho (2013), the essence of this type of tourism is shared experiences, exchanging with visitors and hosts. We

noticed there is little understanding of the community-based tourism by community members and usually it is all about conventional tourism. Hence, the protagonism through the community-based tourism is just beginning, but Vila do Acajatuba is better prepared for it.

The perception of both communities is they are places of belonging, in which bonds of affection or attachment are present. Pollution, noise and agitation are part of the big city context, very different from life in community, where there are rare elements such as security and calmness, even if at times members are not united.

Living in a protected area is also an extremely important factor for the interviewees. They value the natural environment in which they live. Sustainability is mentioned in their talks and seen as the protection of resources and its safeguard for future touristic activities in their territory.

Both communities agree on the need for public institutions, such as the state tourism agency, to fulfill its role, which is to contribute to the development of tourism - which is currently not happening according to the interviewees. In general, a few hurdles in tourism public policies may be noted in the Amazon and they apply perfectly to the reality of Iranduba and the communities' studies: tourism demand still guides government investment actions; the economic focus is the standard for development chosen for tourism; programs proposed do not consider small private businesses. (Sansolo 2013). The latter is the most recurring case; mostly in Vila do Acajatuba and São Thomé.

CONCLUSION

The subjects of the research in *Vila do Acajatuba* are considered advocates and enthusiasts about tourism. The community serves both as housing and as a work environment. People walk around the houses, church, soccer field, school and craft store, under the careful eyes of a group of craft workers who receive visitors in the "place" that grants it identity.

The members of the craft workers' association are very outspoken and major players when it comes to tourism. We do not see the active engagement of all members of the community in the planning, development and management of this initiative. The craft shop, for instance, is a private development in the middle of community and serves as a reference for the Acajatuba Lake. These craftworkers' know-how is depicted in necklaces, bags, wooden etches and is an expression of the passion for their work. The crafts produced attract visitors to the community. We believe community-based tourism here is becoming stronger, but it does not engage all dwellers yet. Hospitality is seen as a trade, but also as a necessary and integrating human relation. Both forms of hospitality do fit into the subjects' social representations conversing with each other.

In São Thomé, emerging social representations indicate concern and pessimism in relation to tourism. The kind of tourism induced by a TV show that spread the word about the community caused distress in the relations among the social groups. Since most members of the communities are blood-related, conflicts became harder to the extent of having two tourism structures set up (one inn and one restaurant), which compete in the same community space with two older structures. One can say there are not enough visitors to use the structures, which increases the conflict.

On the other hand, investments in inns and restaurants have shown the effort of local social actors in looking for a successful tourism business. Investing in community-based tourism needs greater engagement of the community and strengthening community bonds, but the members of Vila de São Thomé are not proactive enough to establish strategies that can benefit them. Each individual is then a major agent itself, not counting on the collectivity. However, the community space represents a "place" of belonging.

Finally, one can infer that social representations identified are extremely useful because they can help understand who the social players are, what they know about tourism, how they know it, how they use their knowledge every day. With the research, one can reflect about the situations-issue revealed in each community space, even if there are still many gaps to be explored in investigating the phenomena. The nature of representations of

local agents does express the nature of the consensual universe in each community space.

This study corroborates the ideas of Sansolo and Burztin (2009), who understand community-based tourism as an option of development for the fishermen, family farmers and extraction workers, thus broadening their daily practice, especially in the rural areas. This is the specific case of the two communities under study. The way to manage tourism in this region is intended at offering the best touristic products and services and contributing to improve the livelihoods of those involved with the activity in local communities. Community-based tourism is then a pathway that is still being paved in this part of Negro River.

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Chapter 13

**PARTICIPATORY PLANNING IN TOURIST
ACTIVITIES WITH BOTOS AT ANAVILHANAS
NATIONAL PARK, AMAZONAS, BRAZIL**

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ABSTRACT

The interaction between people and botos (*Inia geoffrensis*) at Anavilhanas National Park, located in Novo Airão – Amazonas, Brazil, has become known all over the world. However, at its implementation, tourist activities with *botos* were carried out without the aid of any regulations, monitoring or projects with animal welfare or tourist safety in mind, which in turn led to the negative consequences of said activities being laid bare. In this chapter, we present participatory strategies developed for the planning of tourism with botos which resulted in the implementation of guidelines related to the location where such activities take place, its visitors and the animals themselves. These new guidelines significantly reduce risks for tourists and botos alike, improve tourist experience and promote awareness within the population regarding animal life, and can support the development of future projects and public policies aimed at the management of public use in other protected areas.

Keywords: cetaceans, human-wildlife conflict, *Inia geoffrensis*, protected area, Novo Airão

INTRODUCTION

Tourist Activities and Natural Environments

Tourism exerts a great deal of influence in the global economy and consequently in the lifestyles of societies throughout time, as it is regarded as one of the main sources of income in many communities, with some places relying almost exclusively on such activity (Santos and Santos 2011).

At the dawn of the new millennium, tourism already was the largest employer in the world, generating, directly and indirectly approximately 200 million jobs – about 10% of the total around the globe (Honey and Rome 2001). In 2007, the international revenue for tourism in developing countries amounted to 319 billion dollars, tourism being one of the biggest export sectors in these countries, and the primary source of foreign income in 46 out of 49 least developed countries (UNWTO 2012). Silveira (2002) classifies tourism as the main economic activity of the world, surpassing

even oil when it comes to the generation of foreign exchange. Therefore, tourism has been described as the world's largest voluntary transferor of resources from rich to poor people.

Wildlife tourism, part of the ecotourism segment, has been growing amidst the wide spectrum of existing leisure activities (Brasil 2009). Being very charismatic animals and somewhat easily spotted in their habitats, cetaceans have been at the center of a growing demand for interaction (Orams 1996, Reeves et al. 2003). In many places throughout the globe the activity known as whale watching has been established, this consists in the observation of whales and dolphins from the shore or from vessels, as well as swimming and dolphin feeding programs (Parsons and Naomi 2007, Scarpaci et al. 2003).

Tourism, however, such as it is with other anthropic activities, also leads to negative impacts to nature, especially when developed in uncontrolled fashion and focused in time and space (Lobo and Moretti 2008). The inappropriate development of the activity can degrade habitats and landscapes, deplete natural resources, generating garbage and pollution (Denman 2001).

In protected areas, tourism has the potential to create benefits to the environment and contribute to its preservation, since the activity strengthens its appropriation by society while also improving the economy and promoting the creation of jobs and acting as source of income for local populations (Brasil 2006). Nevertheless, leisure and tourism activities in protected areas are also part of the problem when it comes to the management of such protected areas, since in some of them these activities are carried out in a disorderly fashion, without any planning, monitoring or control whatsoever by its managers, which leads to negative impacts, thus compromising the environment as well as the safety of visitors, while also being considered a risk factor to several species (Orams 1996, Romagnoli et al. 2011).

Based on the above contextualization, this chapter presents the actions and discusses the main results and lessons from the participatory planning about interactive tourism with botos (*Inia goffrensis*) at Anavilhanas

National Park, in order to subsidize the implementation of future projects and more efficient public policies aimed at public use in protected areas.

The Boto, a River Dolphin

The boto is the largest river dolphin and is apparently tolerant to human activity, occasionally being spotted next to boats, bathers, fishermen and inhabitants of riverside areas. In some cases, the cetacean seems to seek greater interaction with humans – wild botos are known for grabbing fishermen’s paddles, rub on canoes and, in some cases, they can become quite docile (Best and Da Silva 1989). These botos are usually lonely animals (Best and Da Silva 1989), rarely being observed in cohesive groups of more than three individuals, despite forming larger groups in feeding areas or when involved in mating rituals (Best and Da Silva 1993). The species is largely distributed throughout the basins of the Amazon and Orinoco rivers, being endemic in said areas, while also being present in six countries in South America - Bolivia, Brazil, Colombia, Ecuador, Peru, and Venezuela – and in the rivers Branco and Tacutu, along the Brazil-Guiana border (Best and Da Silva 1989, 1993).

Currently, the boto is classified by the International Union for Conservation of Nature - IUCN as a data deficient species, after being characterized between 1988 and 1996 as “vulnerable” in the IUCN Red List of Threatened Species (IUCN 2012a). However, the IUCN clarifies that the species classified as data deficient must receive the same attention as the ones threatened until an extinction risk study has been made (IUCN 2012b). The species faces several threats in Brazil, among them the use of their carcasses as bait in fishing activities, wholesale slaughter due to conflicts with fishing activities, accidental capture and death by fishing nets, increase in the traffic of ships, loss and degradation of habitats, mortality in oil exploration projects and construction of waterways and dams, and an increase in potentially harmful tourist activities (Alves et al. 2012, Brum et al. 2015, Da Silva and Martin 2010, Gomez-Salazar et al. 2012, Hollatz et al. 2011, Iriarte and Marmontel 2013, Mintzer et al. 2015, Vidal 2011). In

the Manacapuru area, a city near Novo Airão, botos are extremely unwanted and considered a pest by getting in the way of fishing activities (damaging fishing paraphernalia and by taking or damaging the captured fish), being portrayed negatively historically in local myths and legends, and more recently, used as bait in fishing (Alves et al. 2012).

Dolphin Tourism at Anavilhanas National Park

At Anavilhanas National Park, located in Novo Airão, Amazonas, Brazil (Figure 1), tourist activity with botos is carried out. This cetacean, also known as the pink river dolphin, red dolphin or Amazon River dolphin, is a highly charismatic species due to its docile behavior, size, endemism (Vidal 2011, Vidal et al. 2013) and being a fundamental component of Amazonian folklore (Romagnoli et al. 2011).

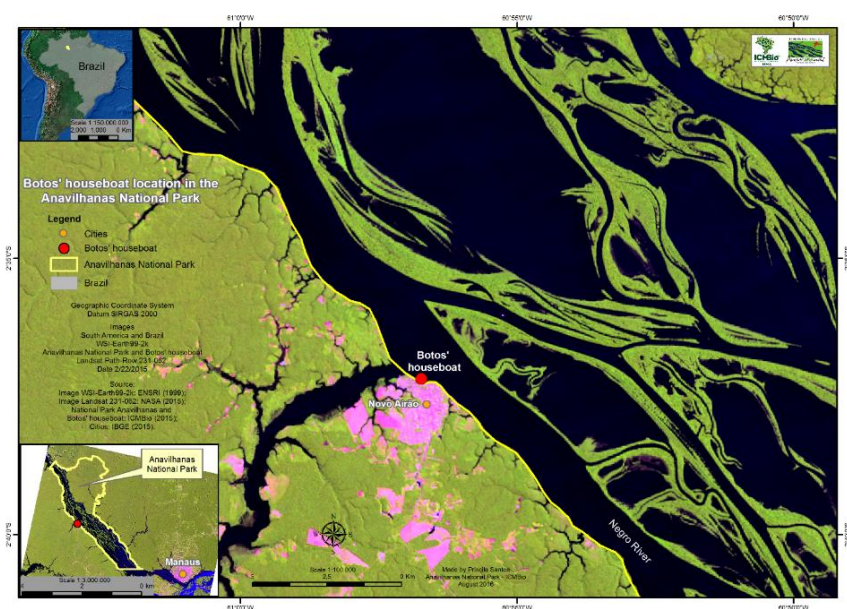


Figure 1. Satellite image of the Lower Negro River, highlighting the city of Novo Airão, Anavilhanas National Park and the location of the botos' houseboat.

Novo Airão is a small town located along the right bank of the Negro River, a 200 km drive from Manaus, capital of the state of Amazonas. Its population census held in 2010 registered a total of 14,723 inhabitants (IBGE 2016). Due to its proximity to Manaus, Novo Airão is currently one of the major tourist destinations for people visiting the Amazon, as well as for the inhabitants of Manaus and other neighboring cities, mostly due to its natural beauties.

Created in 1981 as an Ecological Station and recategorized in 2008 as a National Park, Anavilhanas is a Protected Area managed by the Chico Mendes Institute for Biodiversity Conservation (ICMBio, acronym in Portuguese). With an area of approximately 350,000 hectares, the Park is comprised of forested land areas as well as igapós, various streams, lakes, channels, waterways and about 400 islands.

The human interactions with the botos at Novo Airao started non-intentionally, when a child started offering fish to a boto that roamed around the surroundings of a houseboat restaurant anchored at the south-central region of the Anavilhanas National Park, right in front of the major urban beach of the Novo Airão city (Barezani 2005; Romagnoli 2009, Vidal et al. 2013). As time went by, other botos were attracted by the food and the child started swimming with the animals, which caught the eye of people visiting the city, who in turn started to buy portions of fish in the restaurant to feed the botos too.

The direct interaction between people and botos in the area became an activity known worldwide. Brazilian and foreign tourists were mesmerized by feeding the animals and swimming with them in the waters of the Negro River, which led to it being the main tourist attraction in the city (Alves et al. 2009, Barezani 2005, Romagnoli 2009, Vidal 2011).

The dissemination of boto-related tourism at the Anavilhanas National Park led to the activity being carried out in six other enterprises in the lower Negro River over time, each one located within state Protected Areas (Alves et al. 2013, Vidal pers. obs.). However, in such enterprises, the interaction with botos was being conducted without any regulations, monitoring or with the welfare of the animal and the safety of the tourists in mind (Romagnoli 2009, Vidal et al. 2011).



Figure 2. Negative activities carried out before implementing visitor management: tourists feeding and swimming with the animals.

The absence of regulations and monitoring for the tourist activity of swimming and artificially feeding of the botos made evident the negative effects of the activity (Figure 2) – a large number of tourists interacting with a handful of animals; tourists swimming with the botos and trying to hold them by force; the offering of objects and food products that were not part of the animal's natural diet, such as chips, beer, sausages and bread; tourists accidentally bitten or otherwise harmed by the animals during artificial feeding activities; poorly handled frozen fish sold to tourists and offered to botos; absolutely no control of the quantity of fish given to each boto daily (Alves et al. 2011, Romagnoli 2009, Vidal 2011, Vidal et al. 2013).

Dolphin Tourism and Environmental Regulations

In Brazil there is no specific legislation regarding the artificial feeding of wild animals within Protected Areas, but such activity is prohibited according to the internal regulations of some of those, such as Serra dos Órgãos National Park (Vidal 2011). However, some of the practices

observed at Anavilhanas National Park could be evaluated based on Law 9.605/1998 which establishes penalties in the form of three months to one year of detention and a fine for those who engaged in abusive acts, mistreatment, harm or mutilation of wild, domestic or domesticated animals, native or exotic. We can also consider the Presidential Decree 6.514, Article 30, which establishes fines for anyone who intentionally harasses any species of cetacean, pinniped or sirenia in Brazilian waters. When the crime occurs within the Protected Area, which is the case in the Negro River basin, that penalty shall be increased.

The artificial feeding of wild dolphins as a tourist attraction became a controversial activity (Orams 2002), but still happens across the globe, as is the case in several regions of Australia, United States, and Cuba (Connor and Smolker 1985, Orams 1994, Samuels and Bejder 2004, Donaldson et al. 2010). Negative consequences of this activity include changes in the diet and territorial behavior of the animals, issues related to the ingestion of non-fresh food, possible malevolent poisoning and offering of inappropriate food products, as well as stimulating the animals to ask for food from people that may harm them (Wilke et al. 2005), increase in the risk of human-induced injuries, such as being run over by boats, being caught in fishing paraphernalia and ingesting fish hooks as well as other fishing-related materials (Donaldson et al. 2010).

In Brazil, Santos et al. (2000) described the case of the costero dolphins (*Sotalia guianensis*) which were being fed by a local fisherman in the Cananéia Estuary, an Environmental Protection Area located in the state of São Paulo. In the end of the 1980s, that fisherman started to take tourists on his boat to watch, touch and feed the dolphins with live fish, right next to where his fishing traps were set. In 1997, an educational campaign aimed at the local residents was developed, with the goal to disseminate information of the possible harmful effects of feeding wild dolphins. After that campaign, the aforementioned fisherman ceased activities, but since the number of tourists that went to Cananéia to see the dolphins was high, there were rumors of other local fishermen wishing to start tourist activities that involved artificial feeding.

THE PARTICIPATORY PLANNING OF DOLPHIN TOURISM

Upon facing constant trouble within tourism surrounding botos at the Anavilhanas National Park, the Work Group for the Planning of Tourism with Botos was created (GT dos Botos, in Brazilian Portuguese), with the aid of researchers, representatives of government bodies (technicians from the Environment, Tourism and Education departments), people from the private sector (hotel and restaurant owners), from organized civil society (fishermen colonies, tour operator associations) and the Consulting Council of the Anavilhanas National Park. This group held the goal of carrying out a series of participative actions that would result in a plan for dolphin tourism considering social, economical and environmental aspects related to the activity (Vidal et al. 2013).

With the need to discuss the positive and negative impacts of the tourism model developed in Anavilhanas, the touristic experiences with cetaceans in other regions of the country, the biological aspects of the boto, and the elaboration of a planning proposition for dolphin tourism in Anavilhanas National Park, two seminars were held involving two different parties related to the activity as well as several meetings involving researchers and technicians from government bodies related to tourism and the environment.

As result of the actions carried out by the Work Group, in October 2010 a proposed plan was forwarded to the ICMBio's Board of Research, Evaluation and Monitoring of Biodiversity, the institution responsible for the management of Anavilhanas National Park. Aspects related to the number of tourists, minimum infrastructure and location of the interaction houseboat, animal observation time and more restrictive regulations regarding touching and feeding the botos are some of the topics included in the proposal, besides educational and interpretative activities related to the implemented tourism model.

While the proposal is being analyzed by competent bodies, aiming for the publishing of a Regulatory Instruction by the Brazilian government,

changes in the interactive tourism with botos have already been put to practice in Anavilhanas National Park by means of an action plan, based on the proposed planning, including short, medium and long-term objectives. Among the key changes applied to the activity (Table 1) is the requirement that before interactions with the botos, visitors must receive guidance regarding boto biology and conservation; only employees of the establishment are authorized to feed animals – in preestablished hours and quantities; there is a limit to the number of visitors and allotted time in the observation platforms; and it is no longer allowed to swim with the animals, the visitor being allowed only to stand, passively, on a submerged platform (Figure 3), approximately 1,20 meters deep (Brazil 2010).

Additionally, Ordinance 47/2012 of ICMBio established in its Article 25 that strictly forbids visitors to feed the botos at Anavilhanas National Park.



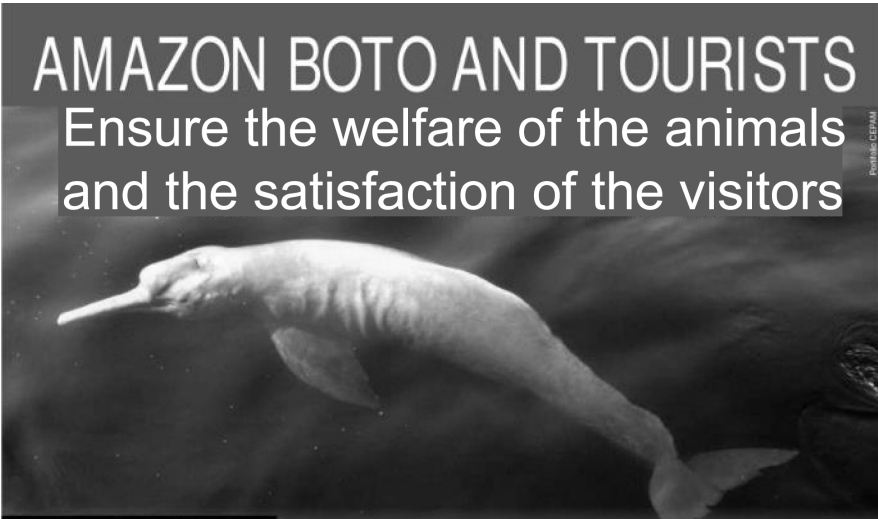



Figure 3. Changes made after the planning: left - limited number of tourists interacting with the animals and only employees can feed them; right - tourists in the submerged interaction platform. The use of life jackets is mandatory, which prevents diving.

Table 1. Key changes made to interactive tourism with botos

Before planning	After planning
No monitoring during the visitation.	Monitoring of the profile and perception of the visitors regarding the activity being carried out.
No prior information given to the visitors.	Prior to the interaction, the visitors watch a lecture about the boto's biology, legends surrounding the animal, main threats to the species and rules for interacting with the animals.
The visitors fed the botos (which occasionally led to bites in the hands of said visitors, who were "tricking" the animals).	Only employees of the houseboat can feed the animals in preestablished schedules, which led to the interruption of these incidents.
No set times to feed the botos. Whenever there were tourists buying fish portions, botos were fed.	Feeding the botos is permitted only in eight daily sessions, with pre-set times and maximum duration of 30 minutes.
There was no control regarding the quantity and quality of the food being offered to the animals (examples: frozen fish, sausages, beer, chips).	Only refrigerated fish can be fed to the botos. There is a limit of 2 kilos of fish a day per boto.
No information available on the possible dependency of the botos on the artificial feeding supplied by the houseboat.	Monitoring of the attendance of each animal on feeding sessions. This information will allow the beginning of the reduction of the food offered to the animals, stimulating their instinct to capture fish in the wild.
No information regarding the distribution of botos in Anavilhanas National Park.	Main areas for the observation of dolphins at Anavilhanas National Park mapped with the tour guides and through population inventories. This information will contribute to foster the observation activity in ships or vessels, without artificial feeding.
No restriction regarding the number of visitors at the interaction platforms.	Limited number of visitors at the interaction platforms based on ergonomic and platform size technical standards.
It was allowed to swim with the animals (which enabled animal harassment and increased the risk of incidents with visitors).	It is now allowed to enter the waters by standing on a submerged interaction platform 1.20 meters deep. The visitors must stay passive at all times in relation to the botos. The use of life jackets is mandatory, which prevents diving.
No restrictions regarding navigation on the houseboat's surroundings, which increased the risk of accidents involving botos/visitors and any nearby ships.	Buoys were set up in an area of approximately 20 meters around the houseboat, which practically nullifies the risk of accidents involving botos/visitors and any ships.

AMAZON BOTO AND TOURISTS

Ensure the welfare of the animals and the satisfaction of the visitors

The Amazon dolphins or botos (*Inia geoffrensis*) live in rivers and lakes of the Amazon and Orinoco basins. Although regularly seen alone, they also occur as mother-calf pairs or in larger groups, especially in feeding areas and during the breeding season. Botos are abundant in the Rio Negro, where interactive tourism has developed owing to the natural curiosity of these animals. If well organized and regulated, such tourism can contribute to the income of local communities, provide tourist satisfaction and add to conservation awareness. The main threat to botos is hunting in order to obtain bait for catching piracatinga, a catfish consumed by many people in Colombia, Peru and some areas of Brazil. Other threats include incidental capture in fishing nets, pollution and boat traffic.

You can help conserve and protect botos:

- Do not feed the animals
- Do not harass them
- Report observations of illegal hunting (Green Line Ibama – 0800 61 8080)
- Keep rivers and lakes clean and healthy

PROJECT PLANNING AND REGULAMENTING THE TOURISM WITH AMAZON BOTOS IN RIO NEGRO BASIN

CEPAM
Centro Nacional de Pesquisa e Conservação da Biodiversidade Aquática

INPA
Instituto Nacional de Pesquisas da Amazônia

ICMBio
Instituto Chico Mendes de Conservação da Biodiversidade

Ministério do Meio Ambiente

GOVERNO FEDERAL
BRASIL
PAÍS RICO E PAÍS SEM POBREZA

Figure 4. Poster with information on the planning of dolphin tourism and the major anthropic effects on the species.

In order to implement a participatory training program that would contribute to the strengthening of environmental awareness, to the improvement of tourist services and the preservation of botos, courses were offered in the areas of Amazonian Ecology, Biology and Preservation of Cetaceans, as well as Sustainable Tourism, which benefited up until now 106 attendants (technicians from environmental and tourism agencies, hotel and restaurant owners, tour guides, houseboat employees, among others), all involved in interactive tourism with botos. As a means to promote a sentiment of appreciation of these people, the participants were selected from suggestions made by their own institutions, always considering the criteria such as a balance in gender, capacity to apply and multiply the knowledge acquired and recognition of the nominee as a leader in his/her group.

With the goal of disseminating information about the planning of dolphin tourism and the main anthropic effects on the species, over 200 copies of a poster (Figure 4) were made and distributed to hotels, inns, restaurants, airports and tourist operators. A banner was also used as dissemination mechanism with information on the biology and anatomy of the botos, which is being used in the places that offer interactive activities with these animals.

CONCLUSION

The city of Novo Airão has few significant economic activities, which places huge expectations on tourism, focusing on the main local attraction, the interactions with botos. Since the activity is being carried out amidst a National Park, it is necessary for ICMBio, in partnership with local tourism and environmental agencies, to plan and monitor this mode of interaction between people and wildlife, considering the strengthening of other sectors or even other economic activities, so that Novo Airão won't rely entirely on tourism and suffer with its weak spots and frailties.

The planning of tourism with botos in Anavilhanas National Park is still undergoing and there are great challenges before reaching excellence in terms of infrastructure and quality. The positive outcome of the changes made so far, however, has been noticed by managers, partners, visitors, regarding the structure of the enterprise (bathrooms with waste treatment, access ramp for the disabled and the elderly, interaction platforms lined with material that reduces the risk of scratches to the dolphins and tourists) as well as the development of the activity, which now supplies more information (lectures on the biology and anatomy of the botos), a greater deal of safety to the visitors (restrictions regarding swimming and feeding the animals), and welfare of the botos (quantity of food supplied, pre-established schedules for feeding, a limit to the number of visitors and time available for interactions).

Other positive consequence include the process itself of coming up with regulations. Part of the success of this planning is attributed to the democratic and participatory nature of the Work Group involved, which took into account the environmental, economic and social dimensions of the activity, aligning itself with the posture of Santos and Santos (2011). They affirmed that the formulation of a tourist policy has to consider the wide segmentation of the activity, so that no activity is favored at the expense of the other, leading to discord between different actors and beneficiaries involved in tourist activity.

There are still some matters that need to go through relevant changes, such as improvements in customer service by the employees at the houseboat, the lack of a published planning norm and the reduced staff at Anavilhanas National Park, deficiencies that lead to losses in the planning and development of dolphin tourism.

RECOMMENDATIONS

The impacts, both positive and negative, are components inherent to tourism, and admitting them may lead to a better understanding of the activity. Even in the ecotourism sector, many of these impacts persist. The

difference, many times, consists on their intensity, scale and scope (Lobo and Moretti 2008). For better planning and development of the interactive tourism with botos at Anavilhanas National Park, we suggest:

- The continuing of the planning of dolphin tourism and related projects;
- The permanent monitoring of compliance with the rules established in the planning;
- An increase in the number of staff at the Park, thus contributing to the planning and monitoring actions of dolphin tourism;
- Legal regulation of the activity by the Ministry of Environment, considering the proposal drafted by the Work Group and the experience carried out by the Park;
- Elaboration of an economic feasibility study regarding dolphin tourism;
- Delegation of the support service to dolphin tourism by means of permission or concession to the private sector;
- Issuance of permit or formal license for the operation of the activity/enterprise within the Park;
- Diagnostics and development of other tourist activities in the urban area of Novo Airão and the Park, thus relieving the weight on dolphin tourism and promoting a longer stay by the tourists in town;
- Elaboration of studies and plans for dolphin tourism based on visitation management methodologies and management of public use considering the enterprise and infrastructure where the activity takes place, the quality of the visitor's experience and the biological resource being explored (botos);
- Creation of indicators for the monitoring of physical, biological and social impacts that show the development of the activity and/or the need for intervention;
- Promotion of environmental awareness, recreation in touch with nature, and ecotourism. Combined, these factors can sensitize

visitors and imbue them with the environmental awareness needed for the development of sustainable tourism in the Park;

- Incentives to the increment of local economy by using the boto as a theme in the creation of craftwork such as wooden miniatures, straw mats, clothing (t-shirts, shorts, swimsuits), jewelry (bracelets, earrings, necklaces), learning materials (notebooks, rulers, diaries), domestic utensils (cups, plates, calendars), among others.

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Chapter 14

**COMMUNITY-BASED TOURISM
IN PROTECTED AREAS:
A MOVE BEYOND “PAPER PARKS”**

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ABSTRACT

This paper argues that Community-Based Tourism (CBT) is a concrete alternative that may contribute to conservation in protected areas, not only by generating economic benefits and conservation strategies, but by being incorporated into people's territoriality, ways of living, life meaning, and identity. Using the case of the Mamirauá Reserve in Amazonas state, this chapter aims to describe the historical conditions where community-based tourism has contributed to the social and political viability of this specific reserve, but also of protected areas as a whole. This study also reflects on the larger role community-based tourism may play in influencing public policies on protected areas, conservation, and sustainable development. In times of downsizing and downgrading protected areas in Brazil, the more a protected area gains visibility, the more the political costs of changing their protective status. Among the diversity of sustainable practices that may be developed in Amazonia, community-based sustainable tourism must be included because it fosters links with the territory, creates productive arrangements that generate and distribute income, and provides experiences to visitors that may transform attitudes.

Keywords: community-based tourism, ecotourism, protected areas, Amazon, sustainable development, Mamiraua sustainable development reserve

INTRODUCTION

Protected areas have increased in number and area over the last decades in the Brazilian Amazon. At present there are 325 protected areas covering 128,060,617 hectares of forest (ISA 2017). Although some may argue that a large portion of them are merely "paper parks" - that is, existing in name only -, there is ample evidence showing that deforestation is much lower inside protected areas than in surrounding areas (Ricketts et al. 2010, 1) and since deforestation is responsible for up to 15% of all greenhouse gases emissions (IPCC 2007, 105), reducing deforestation is considered a cost-effective way to mitigate climate change (Van der Werf et al. 2009, 737).

Studies analyzing implementation costs of forest conservation policies in Brazil estimated that real expenditure costs of federal government from

2000 to 2014 amounted to US\$ 1 billion *per* year on average; with an increase of 44% after 2004, when deforestation actually started to drop (Cunha et al. 2016, 209). Although seemingly cost-effective, in the face of recent economic crisis and decrease in government expenditure in all sectors, conservation policies are more than ever facing critique and losing political viability.

The downsizing and downgrading of protected areas was a process that started in Dilma Rousseff's administration, the former president – from 2008 onwards about 3 million hectares of forest lost their protected status or were downsized. Due to the change of government in Brazil in 2016, major setbacks in conservation policy have occurred and others may be underway. With a net increase of 29% of deforestation in the Amazon and 100% in the state of Amazonas, Temer's current administration is planning to reduce protected areas in the southern region of Amazonas state, one of the main protection belts that have in the past strategically hindered the expansion of land use change in this frontier. This shows just how fragile their protected area statuses really are. Thus, the urgent need to consolidate already existing protected areas in different scales - be it by means of broader social pressure or local demands.

The Convention on Biological Diversity (CBD) has recognized the close dependency of indigenous and local communities on biological resources. But although local populations that inhabit those protected areas have historically engaged with their territory by means of ecological practices - which may be one of the reasons why those territories sustain high levels of biodiversity (Steward and Lima 2017) – granting protected area status to those areas will not guarantee conservation, since they will suffer market and political pressures all the same. There must be a political commitment to provide local populations with the means to continue with their conservation practices giving them institutional support for the sustainable use of biodiversity (Lima 2011, 124).

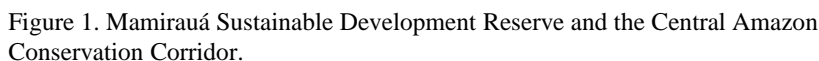
We argue that the social and political sustainability of protected areas is strengthened when local people recognize the importance of maintaining the status of the area, and engage in the protection of the territory, as well as its legal status. Community-based tourism is a concrete alternative that may

contribute to “removing the protected area from paper,” and to placing it in people’s social reality. It may do so not only by generating an association between generation of economic benefits and conservation strategies, but most importantly, by being incorporated into people’s territoriality, ways of living, life meaning, and identity. In short, tourism may change people’s lives and how they see and engage with protected areas.

Using the case of the Mamirauá Reserve in Amazonas state, this chapter aims to describe the historical conditions where community-based tourism has contributed to the social and political viability of this specific reserve, but also of protected areas as a whole. The study was conducted by reviewing literature, historical documents, and quantitative data collected by the tourism enterprise. Open interviews were also conducted with local people who live in the protected area. The chapter is divided into three main sections. The first one is a brief historical account of community-based tourism in Mamirauá, describing the process of planning, development, and monitoring of the initiative over the years. The second part deals with the local outcomes and impacts of tourism, economic or otherwise. In the third part we try and analyze how tourism has been incorporated into people’s modes of living and what this meant locally. Finally, we expand the scale of analysis to reflect on the larger role community-based tourism plays in influencing public policies on protected areas, conservation, and sustainable development (Buckley 2009).

BRIEF HISTORICAL REVIEW

Situated in the state of Amazonas, and some 500 kilometers from Manaus (Figure 1) the Mamirauá Sustainable Development Reserve (SDR) was created in 1990. Mamirauá was the first SDR in Brazil. Its creation was a historical landmark for conservation strategies in Brazilian protected areas, and one developed within the new paradigm on the presence of traditional populations in territories of great relevance for biodiversity (Queiroz 2005, 185).



Its creation was the result of an association between leaders of a social movement (called Preservation Movement) and a group of researchers who, during the eighties, combined efforts toward the common goal of protecting the area from commercial predatory fishing and logging (Reis 2005, 131). The Preservation Movement was first promoted by the local Catholic Church, which had in the previous decade, been involved in organizing locals in politically independent communities. Prior to that, people were dependent on a debt-bondage system of patronage locally known as *aviamento* (Lima-Ayres 1992, 91). When rural commerce declined and patrons moved to urban towns, settlements were scattered along rivers and channels. During the seventies, due to a rise in productivity of the fisheries industry and decline of stocks near urban cities, like Manaus and Itacoatiara, large vessels navigated upriver to deplete stocks on which these communities' livelihoods depended on (Derickx 1992, 59). With the support of local Catholic Church, these communities created a management system, which divided lakes in different categories – preservation, subsistence and open-access lakes. The first two types were to be protected by members of

the communities from exploitation of outsiders; the latter was allocated to the commercial fishing sector. As the Movement lacked legal basis, all preservation efforts like the zoning system, apprehension of poachers' materials, etc. were challenged by local political elites (Reis 2005, 131). The partnership with researchers for the creation of the Reserve in 1990, gave the protection of the area an official, legal status.

During the early nineties researchers and local leaders set out to elaborate and agree upon a zoning system and set of norms for the use of natural resources. In 1996, they achieved this objective, publishing a management plan. The zoning system destined a core area as a totally protected zone, where human settlements and use of natural resources were prohibited. Surrounding this core area a sustainable use zone, where most of the settlements were located and economic productive activities could be carried out. The assignment of a protection zone with restrictions for productive use was regarded as a cost for local communities, which would bear economic losses resulting from the restrictions imposed by the management plan (SCM 1996). Thus, a set of income generating activities were also proposed in the management plan, among them, fisheries management, forest management and ecotourism.

In such context, the Mamirauá SDR established tourism as a strategy to ally conservation of biodiversity and environmental compensation for the imposed costs to the local population after the implementation of the conservation area in that territory (Peralta, Vieira and Ozorio 2017, 17).

With the release of the Mamirauá SDR Management Plan in 1996, ecotourism activities started in 1998, making use of the floating research basis set in the protected area to host visitors, as a testing period. This testing period was particularly important to guarantee the community engagement in the activity. The Mamiraua Institute and the Department for International Development (DFID) agreed to fund an ecotourism enterprise, following the premises set out by the business plan and feasibility study. As a result, the Uakari Floating Lodge was created. The experience promoted by Uakari Lodge was distinct from what the jungle lodges in the Brazilian Amazon offered by then. The interaction with local fauna follows the basic principles of ecotourism; the reality of the riverine community lifestyle is shown with

no social wash and is part of the activities; there is contact with researchers and the infrastructure is continuously redesigned so environmental impacts of the touristic activities are mitigated.

PARTICIPATION AND SHARED MANAGEMENT

The Mamirauá Institute is an organization that is supported and supervised by the Ministry of Science, Technology and Innovation in Brazil. The organization is responsible for providing technical assistance to local communities in order to develop sustainable management projects, like tourism, but its main mission is to conduct scientific research.

Tourism workers at the lodge are formally organized in an association (AAGEMAM): a juridical entity that represents the collectivity of people who work at the Uakari Lodge. The association holds exclusive rights to access work opportunities at the lodge, and it is responsible to normalize this access. Nowadays the organization has 60 associates.

AAGEMAM is responsible for selecting and training new workers, and it is also responsible for hiring services in a rotation system, so as to seek equitable sharing of work opportunities. The Association was also an important partner to improve services quality, and to enable local people to take leadership roles at the lodge. The first local manager was formally employed in 2004. This was considered an emblematic achievement toward strengthening communities' sense of ownership toward the lodge.

The association has suffered from discontinuity of its leaders, which impacted its political maturation. Having said that, due to its social legitimacy, the association has been able to take political stand toward advancing tourism agenda in the protected area in many occasions (Peralta and Lima 2015, 128).

There are eleven local communities that are direct stakeholders of Uakari Lodge. In these communities people's livelihoods are dependent on natural resources, especially fisheries, timber and high lands for agriculture. Income generation comes from sale of produce, salaries and government

cash transfers programs (Lima, and Peralta 2016, 49). Local communities have usufruct rights to the protected area, and to the benefits accruing from biodiversity use. They share collective economic benefits from tourism, investing them in community development projects. Each community elects a political representative every year or so.

This system of representation was already in place when a tourism forum was instituted. Popularly known as the “Presidents' Meeting.” Firstly, the main objective of this forum was to perform the division of the lodge’s profits among communities, but afterwards it became an occasion to discuss other strategic business issues, and to check accounting registers. These forum favored transparency and built social capital among stakeholders, as well increased local communities sense of belonging and ownership of the lodge (Peralta, Vieira and Ozorio 2015, 126).

Sharing benefits from the activity as widely as possible has always been a concern, since one of the main factors associated to the success of ecotourism is distribution of benefits. A study showed that increased involvement in decision-making processes and perceived benefits of tourism are fundamental to attain local support (Lee 2012, 44).

But when tourism generates important economic benefits, but access opportunities are restricted, the activity may exacerbate already existing resource conflicts due to a local perception that the costs of the protected area are collective, but benefits are concentrated (Peralta 2012, 91).

To ask local people to invest their time and work in the planning and development of tourism in the present with uncertain rewards in the future, probably would not encourage strong local support for the ecotourism venture (Harrison and Shankland, 1999). It was clear that local support could be gained only if local people developed a sense of ownership for the enterprise.

Local communities granted the use of their collective territory, and invested their time, and their work in the development of the lodge. Since they were the ones who shared risks and burdens of the venture, they should also share its profits. Thus, the benefit-sharing model proposed was a division of surpluses: 50% paid to communities in the sector where the lodge

was located, and 50% to pay for part of the protection (or surveillance) of the area.

However, due to the closing of local airport for a few months (in 2006-2007), and a world economic crisis (2008 onwards), number of arrivals at the lodge dropped sharply. After four years with no profits, and thus without dividing any collective benefits among local communities, this system was changed after local political controversies over maintaining the protected status of the area. Local leaders and Mamirauá Institute employees concluded that the collective sharing of benefits should be seen as part of the costs of the enterprise to maintain support from local communities toward tourism, and should not have been only associated to the profits, since profits shares are much riskier. From 2013 onwards, a "socio-environmental fee" was included in the price of the tours. Therefore, this benefit became guaranteed, with the total amount varying according to the number of visitors hosted at the lodge each year.

But the crisis led to a conflict - communities started to question the lodge's management decisions, and the formal juridical ownership of the lodge itself, which at the time was still held by the Mamiraua Institute. Conflict management and resolution is of paramount importance to participatory management of natural resources: "people bring varying perspectives, interests, and fundamental philosophies to problems of environmental governance, and their conflicts, if they do not escalate to the point of dysfunction, can spark learning and change" (Dietz, Ostrom and Stern 2003, 1909). Uakari Lodge stakeholders learnt that it was necessary to address some issues to advance in the transfer of management to local communities.

Mamirauá Institute decided to invest more heavily in the Tourism Program hiring new tourism analysts to intensify local training, and improve marketing strategies. Other actions taken were: organization of exchange field trips to other community-based tourism initiatives in South America, the organization of Seminars to discuss the process for transferring the Uakari Lodge to communities, hiring an English teacher, and hiring a consultancy to discuss and propose legal models for this type of social businesses.

Due to a more efficient marketing strategy, rise in international tourist arrivals in Brazil, and the depreciation of the Brazilian currency after 2012, tourism numbers recovered. In 2013, the enterprise was able to divide its profits, and stakeholders decided it was time communities assumed ownership and management of the lodge officially. In that occasion, a formal process of management transfer began, where communities are to become formal owners and the association of workers formal manager of the venture.

But research on this process showed communities were still insecure about the ownership and management of the lodge. Some interviewees stated that the association of workers lacked skills for some more strategic functions; and they were positive about the need to guarantee the Mamirauá Institute technical support and advice, even after ownership was officially transferred (Freire, Neiman and Freire 2015, 10). The results of the research made evident a sense of ownership among those directly involved in the activity, but not so much among those distant or peripherally participating.

In sum, there are concrete challenges that need to be addressed: strengthening of associations and maturation of decision-making forums, transition to a new legal model (Peralta, Vieira and Ozorio 2015, 258), and marketing and managerial skills (Peralta and Cobra 2017, 241).

LOCAL OUTCOMES OF COMMUNITY-BASED TOURISM IN MAMIRAUÁ RESERVE

Economic Benefits

Community-based tourism in protected areas is a conservation strategy recognized by many multilateral organizations. It works under the assumption that when local communities benefit directly from biodiversity, they may have incentive to stop threats to it. The Convention on Biological Diversity establishes as one of its goals, the equitable benefit-sharing from the use of biodiversity as a strategy to strengthen indigenous and local

communities. A former UN Tourism and Environment Program coordinator stated that “under suitable conditions, ecotourism helps conserve biodiversity, helps alleviate poverty in rural areas and can benefit groups of stakeholders such as traditional communities living near or in officially protected areas, as well as indigenous people and women.”

In Mamirauá economic benefits flowing from tourism have been very important, not only as compensation for economic losses, but also as incentives to the conservation of local biodiversity (Peralta 2012, 80). Since 1998 the Uakari Lodge has generated \$ 1,331,062 to local people through formal employment, payments for goods and services (individual benefits), division of profits, and fees paid to local communities and organizations (collective benefits).

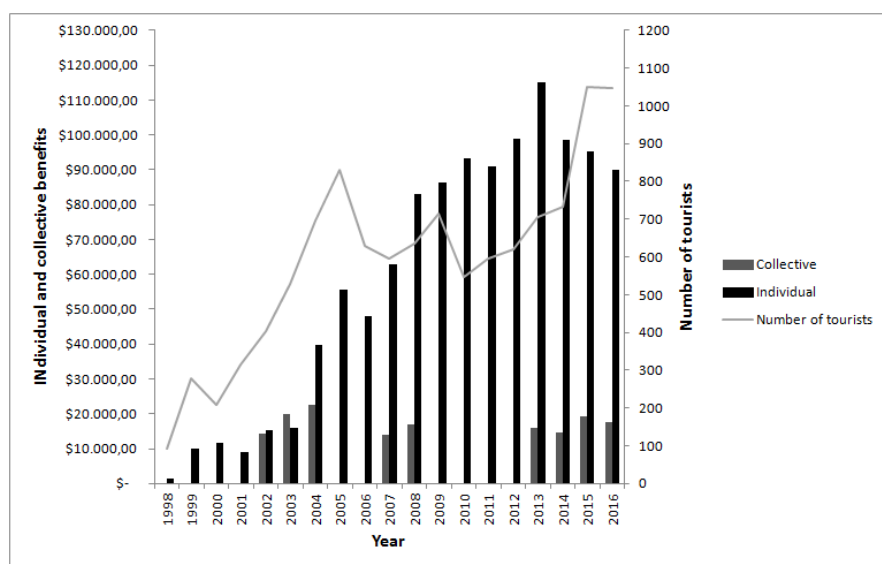


Figure 2. Individual and collective economic benefits generated by Uakari Lodge.

The most significant economic benefits generated by tourism in the area was through hiring of services (guides, cooks, maids) and formal employment (supervisors and local managers). These combined produced a little less than \$ 1 million in payments. Tourism is a highly labor demanding

activity, and due to the peculiarities of the area – during the flood there needs to be one guide per two guests -, it is even more so at Mamirauá. The number of service providers correlate to the number of guests, which have increased over the years, especially since 2012.

Hiring services at Uakari Lodge is different from a conventional business enterprise. Most of the staff works on a rotation system, in average 11 days per month. This strategy aims to distribute as much as possible direct benefits from tourism among local people, and to reduce the risk of total economic dependency on the activity, and abandonment of other traditional ones like agriculture and fishing.

Other characteristic of tourism is its synergistic potential in relation to other economic activities. In Mamirauá this has always been recognized, and whenever possible, the purchase of local produce (such as fish and fresh food) has been prioritized. This may increase local support and interest in the activity, vital for its sustainability. However, major challenges have emerged over the years: low local supply, lack of systematic availability of produce, little guarantee of produce delivery, difficulties in communication between buyer and producers, diversity of producers and product quality, and more recently, increase in internal purchase bureaucracy.

Economic benefits are rather significant to the budgets of some local families. Figure 3 shows the average annual income *per* household from wages, services and selling of produce. In 2011 a population census counted 134 households in the Mamirauá sector, that is, in that year almost 60% of households received payments.

Average annual household income in the eastern part of the Mamirauá Reserve (where the lodge is located) was \$4,045,37 in 2010 (Peralta and Lima 2013, 8). Payments from tourism contributed, in average, to 22% of households' total income (Figure 3). Another study showed that in 2010 in that region, there was a 34% difference in average income between communities with and without tourism involvement (Peralta 2012, 88). This means that income generated by tourism has been rather significant to local families involved.

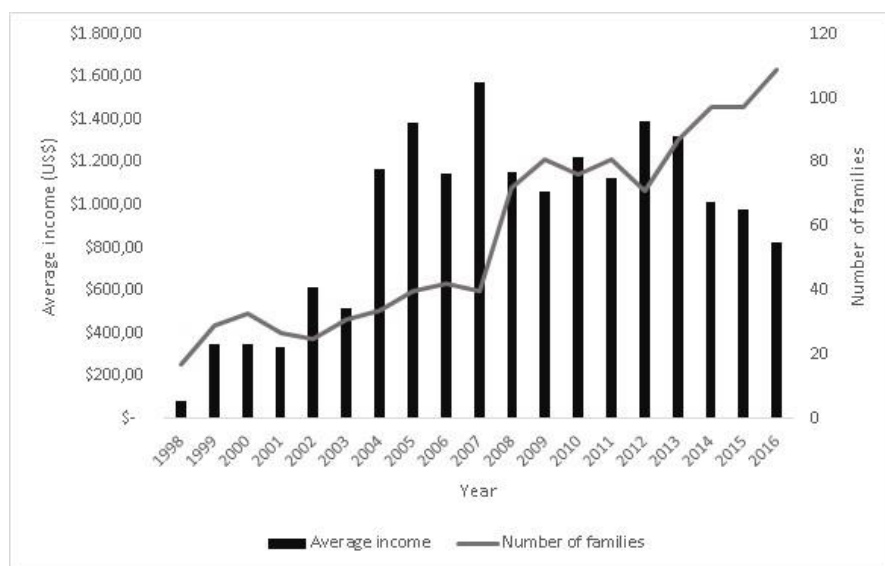


Figure 3. Average annual income received from provision of services and wages (black bars) and number of families (gray line).

Community-Based Tourism and Social Identity

The outcomes of tourism in the protected area are not only associated to economic benefits. A lot of them are non-economic, benefits that are also fundamental in promoting trust and cooperation between key stakeholders (important intangible assets). The Uakari lodge created an intense network of social relations among local people themselves, with guests, and with other tourism professionals from all over the country.

Social interactions among workers while at the lodge, allowed for an intensification of social bonds. This was especially the case among women. Analyzing the social effects of tourism on gender relations, (Peralta and Alencar 2008, 118) found that participation in tourism allowed women to have greater mobility and to establish their own networks of social relations, to exchange information and knowledge, and build networks of solidarity and security.

To their husbands, women were meant only to take care of housework. After starting working with tourism, women became more independent and started to value more their own lives. Women started to have power and voice. Tourism gave us liberty, not only jobs. (Deuzenir Martins, 22/Feb 2017)

The Uakari Lodge became a “community of practices” (Lave, and Wenger 1991, 29), and working at the lodge became part of people’s identity. Participation in this community enabled not only learning new skills, but “the creation and transformation of new identities, which also implied, in the larger social context, to align oneself to the project’s goals” (Peralta and Cobra 2017, 224).

Over the years, the activity has become more than a work opportunity, but a way of life shared among local people. Knowledge, information, experience not only from the work itself, but in large due to the social interactions with people from all over the world are often mentioned as positive outcomes of tourism. Intangible benefits that are fundamental to local people.

What I gained most from this experience [with tourism] was knowledge. It was all this knowledge, all this experience. (...) With the little schooling that I have, I have gained a lot of life experience for my family, for my personal life, for the organization of the community, for the organization of the group, for the improvement of everyone’s lives. So I have gained a lot of experience in this mobilization, hosting tourists. (Ednelza Martins, former Uakari Lodge manager, in Peralta, Ozorio and Martins 2010, 6)

Tourism has definitely enhanced social capital – by which we mean “the connections between people and organizations or the social glue that make things happen” (Emery and Flora 2006, 21). A group with social capital has a collective identity, works together and has a shared vision of the future. This common identity has been built over a large period of time of intense sharing of experiences, learning and overcoming daily challenges.

Community-Based Tourism and Conservation

A clear association between the creation of the protected area and recovery of wildlife populations is readily made when people are asked “what if the Reserve status was not attained?” There is consensus that if it were not a protected area, “the region would have nothing left in terms of timber and fisheries” – for this was the case during the eighties when trees were felled by the hundreds, and commercial fishing vessels from urban centers harvested tons of fish. Depletion of stocks and famine was a reality to the older generation.

Security of land tenure was also another important outcome after the creation of the Reserve. Settlements that existed inside and around the protected area had their land claims officially recognized by the state with the publication of the Reserve’s Management Plan. But attainment of protected area status is not enough. In order to promote the conservation of biodiversity sustainable management projects must be developed. As one of the Reserve’s idealizers has put it:

The establishment of any strategy for the conservation of biodiversity has to take in consideration local social needs. In the coming years, the challenge will be the development of pilot programs that test and demonstrate effective approaches to participation, integrate the human needs and preservation of biodiversity. I believe that if those models succeed, they will spread throughout the Amazon basin without the constant need for law enforcement. The main question to be answered by these pilot programs will be: ‘how local populations will receive enough economic incentives on a sustainable basis so that they will keep interested to heed the rules established by the management plans? (Ayres 2001)

There needs to be economic incentives to conservation, and institutional and technical support to implement them. According to local people, tourism and other sustainable management activities “place the area on the map,” that is, they bring visibility to the protected area, further support and institutional security. Since sustainable management projects such as tourism entail market-integration of land, they make both land and their

claimants more visible to government agencies, and policy makers. So community-based tourism may be an important tool to ‘reinforce land claims, acknowledge cultural identity and land ownership, and regain their rights to access or use tribal land and resources’ (Zeppel 2007, 12). In times of downsizing and downgrading protected areas in Brazil, the more a protected area gains visibility, the more the political costs of changing their protective status.

However, even with visibility and institutional support, local people need incentives to develop sustainable practices, and actively engage in protective measures regulating their own behavior and acting to exclude external threats. A study has shown that in Mamirauá there has been a linkage between tourism and the preservation of the area. Local people who are involved in tourism have positioned themselves for the maintenance of protective status of the region (Peralta and Lima 2015, 128).

But those not directly involved in the activity may perceive the costs of protection as higher than benefits. Linkages between conservation and tourism have to be forged. In fact, collective participation in benefits should be seen as part of the costs of the enterprise to gain support from local communities since its very beginning (Peralta 2012, 85). In Mamirauá, in order to be entitled to receive collective benefits, local communities have to observe norms, such as: observe fishing rules, participate in surveillance expeditions, etc.

CONCLUSION

Despite different rhetoric, development policies for Amazonia have changed little since the military period – infrastructure development, hydropower stations, roads, ranching and monocultures. The country has surprisingly learned little from its recent history, and there are few moves toward less destructive and more sustainable models (Fearnside 2016, 28).

There is only one development model established by the State, one that separates Amazonia into two areas: one destined to be ‘developed’ and other to be ‘conserved’. Protected areas are designed as territories of conservation.

But they could also become laboratories for sustainable development practices to be diffused among the remaining Amazonian territory. Having good practical and applicable examples of sustainable practices is vitally important. Demonstrative models may serve as ammunition in the dispute over development strategies for the Amazon region.

Apart from local outcomes, successful community-based tourism ventures may have impacts beyond the protected area's borders. Over the years, Uakari lodge has hosted a president, ministers, ambassadors, and other decision-makers from the third sector and the corporate world. This has had an impact on the support gained by Mamirauá and Amanã Reserves, and by Mamirauá Institute, which to a certain extent, reverberated in strengthening the socioenvironmental movement inclusive of forest peoples.

Concrete examples are not only important to policy makers, but also to the regular citizens that may be opinion leaders in the region where they come from. Having an authentic Amazon experience, may bring closer to their heart relevant themes related to the conservation of the biome, the livelihoods of traditional populations, and the challenges inherent to development in Amazonia.

There is evidence that the initiative has to some extent contributed to the dissemination of a culture of sustainability. An example of this was a spontaneous article¹ produced by the respected journalist, Eliane Brum, where the author mentions the case of a friend who, when traveling to the Amazon (Mamirauá Reserve) returned "transformed and disturbed" by the experience, which served to create a sentimental bond with the biome: "my friend is now a Brazilian with an Amazonian memory within him, one which startles him with every (bad) news announced by the newspapers of São Paulo, where he lives."

Uakari Lodge's media visibility worldwide is also relevant to the dissemination of a vision of the future for Amazonia that is socio-environmentally responsible and economically inclusive.

¹ <http://revistaepoca.globo.com/Revista/Epoca/0,,EMI238946-15230,00-SE+A+AMAZONIA+E+NOSSA+POR+QUE+NAO+CUIDAMOS+DELA.html>.

I can say without a shadow of a doubt that Uakari Lodge is one of the most astonishing eco-ventures I've ever come across, not just minimising traveller-footprint but actively contributing to conservation of the area. For the serious ecotourist, who believes that there must be a way to behold the world's greatest natural ecosystem without contributing to its destruction, this is the only viable option. (*The Guardian*, 28th of March, 2009²)

The Uakari Lodge has been a laboratory for techniques, methodologies and research in the area of ecotourism and conservation (Ozorio, and Pinto 2017, 64). As one of the pioneering initiatives in the country, generating this type of information is of great value to subsidize actions in other sites. The Mamiraua Institute offers a course for community-based tourism *multipliers* trained to disseminate such practices.

In the aforementioned article, Eliane Brum asks an important question: “if the Amazon is ours, why we do not take care of it?” According to her, the forest is only an abstraction for most Brazilian people, and there is no real, concrete appropriation, that may turn into concern and care for what one loves.

The Amazon needs to be read, felt and lived by us as a society, so that we exercise our duty to act toward its sustainability. Otherwise, the business-as-usual economic model will continue to be thoughtlessly replicated in the biome.

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² www.theguardian.com/travel/2009/mar/28/amazon-brazil-green-travel-ecotourism.

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INDEX

A

academic, 10, 28, 29, 31, 32, 33, 34, 36, 38, 42, 49, 71, 213, 215, 291
accidental capture, 278
acting competently, 105
administrators, 121
adventure, 5, 11, 29, 30, 33, 34, 36, 42
adventure tourism, 5, 30, 33, 36, 42
agencies, 13, 29, 49, 56, 83, 84, 88, 101, 109, 129, 180, 184, 186, 238, 265, 266, 268, 287, 312
agriculture, 303, 308
Amazon, 79, 101, 102, 106, 107, 108, 109, 110, 112, 116, 160, 180, 182, 185, 187, 188, 189, 196, 208, 219, 256, 257, 259, 260, 261, 269, 272, 273, 275, 278, 279, 280, 290, 291, 292, 293, 294, 298, 299, 301, 302, 311, 313, 314, 315, 316
Amazon River, 180, 188, 279, 290, 292, 293, 294
Amazon River dolphin, 279, 290, 293, 294
analysis paralysis, 209

Anavilhanas National Park, 204, 207, 209, 275, 276, 278, 279, 280, 282, 283, 284, 285, 288, 289, 295
Assateague Island National Seashore, 119
atmosphere, 224

B

BARREIRINHAS – MA, 238
behavior, x, 10, 90, 168, 169, 172, 263, 279, 282, 312
behaviors, 293
Belgium, 155
belvederes, 140, 141, 145, 149, 151
best practices, vi, 50, 66, 110, 111, 112, 115, 174, 179, 180, 183, 205
bibliometric investigation, 33
biodiversity, vi, x, xiii, 20, 26, 28, 37, 40, 42, 44, 45, 48, 49, 56, 58, 61, 62, 63, 64, 65, 67, 68, 71, 100, 101, 102, 106, 108, 109, 110, 111, 115, 117, 118, 119, 121, 123, 124, 125, 131, 133, 134, 135, 136, 137, 138, 150, 158, 159, 162, 173, 175, 180, 182, 187, 217, 218, 230, 252, 275,

280, 283, 291, 293, 299, 300, 302, 304, 306, 307, 311, 314, 315, 316
 biology and conservation, 32, 284
 biosphere, 213, 217, 218, 219, 220, 226
 biosphere reserve, 213, 217, 218, 219, 220, 226, 231
 boat, 57, 82, 106, 107, 261, 262, 282, 292
 Brazilian journals, 32, 35
 Brazilian protected area, ix, x, xi, xiii, 2, 3, 4, 10, 12, 33, 93, 119, 136, 158, 159, 161, 208, 300
 building capacity, vi, 99, 103, 104, 105, 111, 113, 114, 115, 179, 207
 building confidence, 181, 207
 businesses, 53, 104, 111, 237, 238, 243, 269, 305

C

Campos Gerais National Park, vi, 157, 158, 162, 163
 capacity building, 13, 38, 103, 109, 113, 114, 115, 180, 189
 capacity development, 103, 104, 105, 111, 113, 114, 115, 116, 180, 181, 182, 210
 carrying capacity, 2, 3, 5, 9, 12, 14, 15, 16, 17, 19, 20, 21, 22, 23, 24, 174
 Catoctin Mountain Park, 119
 cetaceans, 276, 277, 278, 279, 282, 283, 287, 293
 Chapada dos Veadeiros National Park, 58, 140, 141, 142, 151, 154, 207
 Chesapeake & Ohio Canal National Historical Park, 119
 cities, 79, 85, 106, 234, 237, 243, 244, 280, 301
 climate, 102, 219, 248, 298
 climate change, 101, 102, 298, 315, 318
 communication, 118, 131, 132, 134, 181, 256, 257, 261, 262, 271, 308

communities, x, 29, 30, 34, 37, 41, 47, 53, 69, 74, 77, 82, 83, 89, 90, 100, 101, 102, 104, 106, 107, 110, 111, 120, 122, 125, 126, 127, 129, 132, 136, 189, 192, 200, 202, 203, 205, 212, 219, 221, 222, 225, 226, 227, 238, 239, 256, 257, 258, 259, 260, 261, 262, 263, 267, 268, 269, 270, 271, 274, 275, 276, 299, 301, 302, 303, 304, 305, 306, 307, 308, 312
 community-based, vii, 27, 30, 53, 62, 183, 189, 195, 199, 247, 250, 256, 257, 258, 266, 268, 270, 271, 292, 297, 298, 299, 300, 305, 306, 309, 311, 312, 313, 314, 317
 community-based tourism, vii, 27, 30, 195, 256, 257, 258, 266, 268, 270, 271, 297, 298, 299, 300, 305, 306, 309, 311, 312, 313, 314, 317
 concept, 2, 3, 26, 28, 29, 30, 67, 69, 89, 90, 91, 140, 144, 146, 198, 201, 212, 213, 214, 215, 216, 217, 226, 239, 247, 254, 257, 258
 concessions, 48, 49, 50, 54, 57, 58, 60, 65, 66, 87, 112, 189, 190
 conflict, 108, 122, 125, 126, 198, 221, 270, 276, 305
 conscientization, 212, 216, 226
 conservation, xi, xvii, 2, 4, 5, 6, 18, 19, 21, 22, 25, 26, 27, 28, 29, 30, 32, 33, 34, 37, 40, 41, 42, 43, 44, 47, 48, 49, 51, 53, 54, 58, 62, 63, 67, 68, 71, 83, 84, 85, 89, 91, 92, 93, 99, 100, 101, 102, 103, 104, 105, 108, 109, 111, 112, 115, 118, 120, 122, 123, 124, 125, 126, 131, 135, 136, 138, 140, 141, 142, 145, 151, 158, 159, 161, 162, 173, 175, 180, 182, 187, 218, 219, 230, 252, 275, 278, 280, 284, 291, 292, 293, 298, 299, 300, 301, 302, 306, 307, 311, 312, 313, 314, 315, 316, 317, 318
 conservation of nature, 25, 26, 27, 29, 30, 34, 37, 41, 48, 138, 278

construction, 29, 190, 194, 198, 221, 224, 258, 259, 278
 convention on biological diversity, 52, 63, 65, 102, 299, 306, 318
 critical thinking, 104, 111, 112, 114, 185
 cultural heritage, 99, 184, 188
 cultural practices, 126
 culture, 5, 180, 181, 234, 257, 262, 268, 313, 316
 culture of learning, 180

D

data collection, 10, 12, 13, 31, 158, 241
 data for decision-making, 158
 deciding confidently, 105
 deforestation, 102, 127, 133, 298, 299
 degradation, 164, 219, 278, 292
 demand, ix, x, 2, 4, 27, 36, 37, 54, 56, 60, 67, 69, 70, 71, 77, 83, 84, 86, 87, 88, 89, 91, 92, 101, 113, 150, 154, 169, 211, 220, 234, 236, 241, 242, 245, 247, 250, 251, 269, 277, 316
 demonstration sites, vi, 115, 179, 180, 181, 182, 183, 184, 185, 187, 200, 201, 202, 206, 207, 209
 destination, 27, 29, 33, 34, 37, 56, 68, 69, 70, 72, 77, 82, 83, 84, 85, 86, 87, 89, 90, 91, 92, 158, 180, 188, 221, 246
 developed countries, xii, 276
 developing countries, xii, 27, 28, 119, 276
 development policy, 211, 222
 direct observation, 37, 38, 234
 document analysis, 37, 38
 dolphin feeding, 277
 downsizing, 298, 299, 312

E

ecological processes, 14, 82, 145

ecological stations, 5, 101, 106
 ecological tourism, 5, 27
 ecology, xii, 3, 9, 10, 13, 20, 29
 economic activity, 219, 256, 265, 267, 276
 economic benefits, 120, 134, 235, 236, 239, 240, 267, 298, 300, 304, 306, 307, 308, 309
 economic development, 3, 14, 99, 103
 ecosystems, x, 14, 15, 20, 30, 40, 43, 51, 68, 99, 116, 127, 145, 185, 196, 208, 217, 218, 219, 292, 314
 ecotourism, xii, xiii, 5, 17, 19, 22, 25, 26, 27, 28, 29, 30, 31, 33, 34, 36, 37, 38, 39, 42, 43, 44, 45, 64, 68, 93, 118, 136, 155, 158, 161, 174, 175, 220, 272, 277, 288, 289, 292, 293, 294, 298, 302, 304, 307, 314, 316, 317, 318
 education, 5, 29, 33, 37, 38, 42, 52, 61, 106, 111, 125, 133, 164, 174, 184, 215, 218, 226, 238, 293
 educational process, 216
 employees, 60, 118, 121, 125, 130, 188, 207, 209, 225, 284, 285, 287, 288, 305
 environment, 2, 6, 9, 14, 18, 22, 33, 34, 37, 43, 45, 49, 52, 53, 62, 65, 72, 91, 101, 105, 135, 141, 161, 164, 201, 209, 217, 229, 238, 248, 249, 251, 253, 262, 266, 269, 277, 283, 289, 290, 307, 314
 environmental, ix, xii, xiii, xvi, 5, 6, 7, 8, 10, 13, 14, 21, 22, 23, 25, 27, 29, 30, 33, 34, 37, 38, 40, 42, 47, 48, 49, 51, 52, 55, 59, 60, 64, 100, 105, 107, 109, 116, 117, 125, 134, 135, 136, 137, 138, 140, 141, 142, 148, 153, 155, 156, 159, 160, 161, 163, 174, 175, 176, 180, 184, 213, 215, 219, 220, 221, 222, 226, 228, 240, 250, 251, 252, 273, 274, 281, 282, 283, 287, 288, 289, 290, 293, 294, 295, 302, 303, 305, 315
 environmental aspects, 14, 29, 283

environmental awareness, 25, 29, 30, 34, 37, 38, 42, 287, 289
 environmental conditions, 184
 environmental degradation, 159, 219
 environmental education, 33, 38, 125, 174, 184
 environmental factors, 10
 environmental impacts, 25, 27, 33, 34, 37, 38, 105, 140, 161, 175, 303
 environmental interpretation, 33, 180, 293
 environmental issues, 48, 294
 environmental movement, 220, 222
 environmental protection, 226
 environmental quality, 13
 environmental sciences, xii, xvi, 42
 environmental services, 14, 27, 30
 environmental sustainability, 49, 163
 environmental variables, 153
 Espinhaço Range Biosphere Reserve, vi, 211, 212, 213, 218, 226, 229
 exotic species, 122, 123, 124, 133
 extractive reserves, 101, 106, 187

F

families, 27, 222, 223, 265, 308, 309
 farmers, 234, 235, 243, 246, 249, 260, 271
 farms, 151
 fauna, 3, 4, 6, 12, 13, 33, 34, 76, 137, 219, 302, 316
 federal, xvi, 1, 4, 5, 8, 9, 10, 23, 26, 34, 40, 41, 49, 52, 55, 58, 67, 68, 70, 71, 84, 89, 92, 100, 101, 107, 109, 117, 125, 129, 130, 135, 137, 138, 155, 158, 159, 160, 161, 163, 173, 176, 177, 186, 209, 230, 245, 255, 275, 290, 293, 297, 298
 federal agency, 71, 158, 159
 federal government, 129, 298
 financial, 3, 11, 13, 27, 53, 54, 56, 58, 60, 61, 65, 88, 102, 107, 109, 125, 242, 244
 financial resources, 3, 27, 56, 61, 65, 125

fish, 101, 236, 243, 244, 279, 280, 281, 282, 285, 308, 311
 fisheries, 251, 252, 290, 292, 301, 302, 303, 311
 fishing, 124, 140, 234, 235, 237, 242, 278, 282, 301, 308, 311, 312
 fishing activities, 278
 flora, 33, 34, 76, 219, 310, 315
 flora and fauna, 219
 food, 7, 56, 73, 122, 196, 221, 237, 242, 247, 261, 262, 265, 280, 281, 282, 285, 288, 308
 food production, 221, 242
 food products, 281, 282
 forest management, 87, 189, 198, 302
 forest resources, 110
 forum, 33, 90, 93, 174, 209, 304
 freedom, vi, 41, 211, 212, 215, 216, 226, 231, 240, 254
 freshwater, 101
 fruits, 216, 244
 full protection areas, 5
 funding, 13, 52, 109, 129, 169, 172

G

geographical information systems, 140
 geology, 173
 geoprocessing, 141, 153, 155
 geotourism, 30
 global climate change, 101
 Great Falls Park, 119
 green areas, 27, 40
 green tourism, 30
 greenhouse, 298
 greenhouse gas, 298

H

habitat, 30, 122, 123, 133, 277, 278
 habitat fragmentation, 123

Harpers Ferry National Historical Park, 119
 health, 27, 52, 224, 238, 261, 262
 human, xiv, 3, 11, 27, 29, 34, 48, 61, 72, 83,
 102, 104, 114, 118, 133, 214, 216, 218,
 221, 226, 227, 234, 239, 247, 264, 267,
 270, 276, 278, 280, 282, 302, 311
 human activity, 83, 278
 human development, 72, 216, 218, 226, 239
 human development index, 72, 74, 86, 216,
 239
 human resources, 11, 48, 102, 114
 human rights, 221, 227
 human-wildlife conflict, 276
 hunting, 41, 122, 123, 124, 133, 140

I

ICMBio, xvii, 8, 10, 48, 49, 50, 54, 56, 57,
 58, 60, 61, 62, 68, 71, 72, 73, 85, 86, 87,
 91, 100, 101, 109, 110, 111, 112, 117,
 119, 125, 157, 158, 168, 172, 173, 174,
 180, 181, 187, 188, 189, 191, 194, 195,
 198, 199, 200, 201, 202, 203, 207, 209,
 252, 275, 280, 283, 284, 287, 291
 illegal hunting, 123, 124, 133
 56, 59, 60, 67, 92, 116, 124, 131, 150, 159,
 161, 181, 182, 221, 222, 224, 229, 313
 impacts of tourism, 2, 7, 34, 42, 300
 income, 54, 61, 102, 205, 215, 216, 219,
 220, 221, 225, 233, 234, 235, 237, 238,
 239, 246, 247, 256, 259, 265, 267, 268,
 276, 277, 298, 302, 308, 309
 income inequality, 225
 indicators, 2, 4, 7, 8, 9, 10, 11, 12, 14, 20,
 21, 42, 67, 72, 75, 87, 88, 92, 156, 161,
 165, 170, 171, 175, 216, 289, 292
 indigenous lands, 33, 34, 41, 109, 318
 indigenous peoples, 107
 indigenous reserves, 101, 107
 infrastructure, 3, 7, 51, 56, 70, 82, 83, 84,
 86, 88, 100, 106, 110, 111, 118, 126,

 130, 132, 133, 150, 151, 159, 165, 169,
 183, 184, 190, 198, 202, 256, 261, 262,
 283, 288, 289, 303, 312
Inia geoffrensis, 276, 290, 291, 292, 293
Inia geoffrensis, 277
 intensive use zones, 7
 intervalles state park, 12, 21
 interviews, 37, 38, 141, 223, 234, 241, 243,
 247, 263, 265, 300
 Itatiaia National Park, 11, 12, 15, 19, 119,
 159
 IUCN, 14, 17, 19, 34, 40, 41, 44, 69, 91, 93,
 100, 115, 136, 278, 292, 293

J

Jericoacoara National Park, 234, 235, 237,
 252
 JIJOCA DE JERICOACOARA – CE, 238
 Jurubatiba Restinga National Park, 119

L

lakes, 280, 301
 land tenure, 68, 72, 74, 125, 126, 133, 311
 landscape, xvi, 69, 83, 84, 85, 90, 101, 136,
 140, 141, 147, 151, 153, 155, 156, 162,
 168, 169, 183, 194, 198, 204, 236, 277
 landscape analysis, 140, 153, 156
 Latin America, 119, 215, 230, 273
 law enforcement, 53, 104, 124, 125, 127,
 134, 311
 learning, 27, 105, 108, 111, 114, 180, 181,
 183, 185, 186, 202, 226, 290, 305, 310,
 315, 317
 legal framework and policies, 50
 legislation, 52, 54, 59, 159, 281, 290
 Lençóis Maranhenses National Park, 235,
 248, 251
 limits of acceptable change, 3, 4, 7, 20, 92

local communities, 29, 30, 37, 47, 53, 82, 89, 90, 100, 102, 104, 110, 122, 125, 126, 127, 129, 132, 202, 222, 225, 226, 239, 259, 271, 299, 302, 303, 304, 305, 306, 307, 312

local community, 111, 122, 126, 189, 233, 234

local development and inclusiveness, 234

local government, 222

local tourism productive system, 235

LTPS, 235, 241

M

Mamiraua sustainable development reserve, 298, 317

managerial aspects, ix

market, ix, 27, 36, 41, 42, 50, 54, 55, 56, 173, 174, 223, 226, 240, 241, 244, 260, 299, 311

mass tourism, 27

mining, vi, ix, 124, 211, 212, 213, 219, 220, 221, 222, 224, 225, 226, 227, 228

modernization, 212, 213, 214, 217, 221, 222, 224, 225, 226

monitoring, 2, 3, 4, 5, 9, 12, 13, 14, 18, 21, 22, 26, 48, 49, 53, 59, 60, 61, 71, 100, 105, 107, 108, 110, 112, 113, 124, 126, 131, 132, 177, 185, 190, 192, 194, 196, 198, 199, 202, 203, 205, 276, 277, 280, 281, 283, 285, 289, 300, 316

motivation, 34, 55, 167

municipal, 5, 34, 41, 55, 205, 220, 237, 245, 248, 251, 253, 254, 261, 262

N

national forest, 6, 16, 23, 68, 71, 87, 91, 100, 159, 160, 174, 187, 189, 196, 203, 207

national park service, 21, 23, 90, 109, 117, 119, 129, 136, 186

national parks, v, vi, vii, 1, 2, 3, 5, 6, 7, 11, 16, 18, 19, 21, 22, 23, 40, 44, 47, 48, 49, 50, 51, 52, 53, 55, 56, 57, 58, 59, 60, 61, 62, 64, 65, 68, 70, 71, 75, 87, 88, 90, 91, 92, 93, 105, 106, 109, 115, 117, 118, 119, 120, 122, 123, 124, 126, 127, 128, 129, 133, 134, 135, 136, 137, 155, 156, 157, 159, 160, 162, 172, 175, 176, 186, 187, 234, 235, 236, 239, 275, 280, 281, 283, 287, 288

natural areas, v, vi, 1, 2, 3, 5, 9, 11, 13, 14, 15, 20, 21, 26, 28, 29, 33, 37, 38, 42, 65, 139, 140, 141, 153, 154, 155, 220, 239

natural heritage, ix, x, xi, 1, 3, 6, 100, 102, 103, 105, 106, 108, 110, 112, 113, 114

natural resources, x, xi, 2, 4, 5, 6, 40, 68, 70, 89, 90, 101, 109, 110, 140, 154, 158, 159, 173, 277, 302, 303, 305

nature appreciation, 30

nature conservation, 3, 5, 6, 40, 51

nature tourism, v, x, xii, xiii, xiv, 3, 25, 27, 28, 29, 30, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 141, 154, 294

nature-based tourism, 4, 30, 93, 103, 107

Negro River, 265, 271, 279, 280, 282, 291

Novo Airão, 275, 276, 279, 280, 287, 289, 292, 294

O

Organized Worker's Local Groups (OWLG), 241

outdoor recreation, 15, 20, 68, 70, 72, 73, 85, 88, 89, 90, 92, 93, 162, 172, 174

outlooks, 140, 141

ownership, 38, 51, 61, 72, 108, 113, 141, 203, 261, 265, 303, 304, 305, 306, 312

P

paper parks, vii, 297, 298

papers, x, 3, 4, 12, 26, 29, 31, 32, 33, 34, 35,
36, 37, 38, 39, 42, 49, 135, 221, 235,
241, 254, 256

Paraná, 15, 23, 58, 137, 138, 158, 162, 163,
176, 177

park, 3, 11, 12, 13, 14, 16, 18, 19, 21, 22,
23, 56, 77, 85, 92, 107, 117, 118, 119,
120, 121, 124, 125, 126, 127, 128, 129,
130, 131, 132, 133, 134, 136, 142, 145,
147, 148, 149, 151, 154, 158, 159, 162,
166, 167, 174, 175, 177, 186, 224, 234,
237, 245, 248, 280, 289, 290

park infrastructure, 130, 132, 133

park management, 13, 117, 118, 119, 122,
133, 134, 177

park vulnerability, 118, 120, 127, 133

participative actions, 283

participatory management, 28, 305, 315,
317

partnership management and monitoring,
48, 59

partnerships, v, ix, xiii, 47, 48, 49, 50, 51,
52, 53, 54, 55, 56, 58, 59, 60, 61, 63, 64,
181, 192, 195, 202

people and nature, 28

planning, vi, vii, ix, 2, 6, 7, 8, 9, 14, 17, 18,
20, 23, 33, 37, 38, 44, 49, 53, 54, 60, 61,
64, 72, 73, 80, 87, 90, 91, 92, 93, 99,
100, 106, 107, 109, 110, 111, 112, 115,
120, 131, 132, 133, 139, 140, 141, 145,
150, 151, 154, 155, 156, 157, 169, 182,
183, 185, 188, 190, 191, 192, 193, 199,
202, 203, 204, 207, 229, 251, 253, 270,
273, 275, 276, 277, 283, 284, 285, 286,
287, 288, 289, 294, 299, 300, 304

plants, 101, 123, 127

policy, 31, 43, 47, 48, 49, 52, 55, 184, 186,
191, 203, 207, 209, 212, 213, 215, 220,
240, 250, 288, 299, 312, 313, 315

policy development, 191, 209

pollution, 124, 239, 277

preservation, 38, 159, 277, 287, 301, 311,
312

Prince William Forest Park, 119

private, ix, xiii, 1, 4, 5, 6, 11, 26, 34, 41, 47,
49, 50, 51, 52, 53, 54, 55, 56, 58, 61, 62,
63, 64, 65, 85, 101, 111, 137, 163, 172,
202, 225, 234, 266, 269, 270, 283, 289

profile, 34, 37, 75, 84, 155, 157, 158, 161,
165, 172, 174, 176, 221, 285, 295, 316

protection, x, 5, 6, 10, 13, 28, 29, 40, 45, 48,
51, 56, 58, 61, 100, 101, 102, 105, 106,
107, 108, 109, 121, 126, 158, 159, 165,
218, 269, 299, 302, 305, 312

public good, 51, 52, 61

public policies, 33, 37, 138, 235, 249, 254,
269, 276, 278, 298, 300

public service, 51, 52, 54, 63, 224, 225

public use, vi, xi, 1, 2, 5, 6, 8, 9, 10, 11, 13,
17, 19, 21, 22, 23, 47, 48, 49, 50, 54, 60,
61, 62, 68, 99, 100, 101, 104, 105, 106,
107, 109, 110, 111, 112, 113, 114, 117,
118, 119, 124, 134, 135, 137, 158, 161,
164, 175, 176, 179, 180, 183, 184, 187,
188, 189, 190, 192, 193, 194, 195, 199,
200, 201, 202, 203, 204, 206, 207, 209,
276, 278, 289

public use management, 99, 100, 104, 106,
107, 112, 113, 114, 180

public use program, 180, 188, 189, 193,
194, 195, 199, 202, 207

public-private partnerships, ix, 50, 51, 55,
64

Q

qualitative, 26, 33, 38, 42, 168, 241, 253, 256, 272
 quality of life, x, 28, 48, 240, 267
 quantitative, 14, 26, 33, 38, 42, 88, 146, 164, 253, 272, 300

R

RAPPAM (rapid assessment and prioritization of protected area management), 118, 119, 120, 135
 recreation, x, xii, 3, 4, 5, 8, 9, 10, 13, 20, 29, 61, 67, 68, 69, 70, 72, 73, 75, 79, 80, 83, 84, 85, 87, 88, 89, 90, 92, 111, 158, 162, 165, 169, 172, 173, 174, 175, 177, 184, 289
 recreation ecology, 9, 10, 13, 15, 20, 29
 recreational carrying capacity, 3, 4, 9, 13, 24
 recreational impacts, 2, 3
 recreational use, 2, 3, 4, 5, 6, 7, 10, 11, 14, 70, 75
 research, v, ix, x, xi, xii, xiii, xv, xvi, 2, 3, 4, 8, 10, 12, 13, 14, 15, 17, 19, 20, 25, 26, 28, 31, 32, 33, 38, 39, 40, 41, 42, 43, 45, 47, 50, 60, 63, 71, 84, 86, 88, 90, 91, 92, 106, 113, 115, 118, 122, 131, 132, 133, 134, 140, 141, 142, 145, 148, 151, 154, 158, 169, 174, 183, 189, 192, 198, 213, 218, 221, 222, 228, 229, 235, 241, 243, 250, 256, 262, 263, 264, 266, 267, 269, 270, 271, 272, 273, 275, 283, 291, 293, 294, 295, 302, 303, 306, 314
 researchers, x, xi, xii, xiii, 4, 7, 12, 29, 38, 82, 158, 169, 215, 258, 283, 301, 302, 303
 reserves, 26, 101, 106, 108, 187, 213, 217, 218, 219, 226
 resource management, 172, 183, 218

resources, ix, x, xi, xvi, xvii, 2, 3, 4, 5, 6, 10, 11, 17, 18, 20, 27, 41, 48, 51, 52, 53, 54, 56, 59, 61, 65, 68, 70, 72, 82, 83, 89, 90, 92, 93, 101, 102, 103, 109, 110, 114, 121, 122, 125, 126, 127, 129, 132, 134, 136, 140, 141, 154, 157, 158, 159, 161, 173, 177, 179, 201, 218, 228, 239, 251, 260, 262, 269, 277, 299, 302, 303, 305, 312
 reverse viewshed, 140, 143, 149, 150, 152
 review, xv, 10, 19, 20, 26, 28, 31, 33, 38, 42, 49, 66, 110, 193, 194, 228, 229, 241, 293, 300
 Rio Negro Sustainable Development Reserve, vii, 255, 256
 river dolphin, 278, 279, 290, 291, 292, 295
 riverine communities, 259
 Rock Creek Park, 119
 rural areas, 261, 271, 307
 rural population, 259, 316

S

satisfaction, 34, 37, 154, 161, 165, 170, 171, 172, 174, 192
 scenic beauty, 30, 41, 150
 science, ix, x, 31, 32, 102, 109, 114, 115, 256, 257, 315
 scientific journals, 31, 32, 33
 scientific knowledge, 42
 scientific papers, 29
 scientific publications, 31, 42, 264
 scientific tourism, 30, 32, 42
 scientometric, v, 25, 30, 33
 scientometric approach, v, 25, 30
 Serra da Bocaina National Park, 119
 SNUC, 5, 6, 20, 52, 159, 161, 201
 social exclusion, 234, 239, 240, 250, 253, 254
 social inclusion, ix, 65, 234, 235, 240, 246, 249, 254

social representations, 256, 257, 258, 263, 264, 267, 268, 270, 272, 273

social sciences, 29, 32, 38, 213, 214

social-productive inclusion, vi, 233, 234, 235, 236, 241, 242, 245, 246, 248, 249, 250

social-productive inclusion factors, 241, 242

society, ix, 14, 41, 48, 51, 52, 61, 104, 106, 111, 113, 158, 181, 187, 201, 202, 212, 214, 216, 221, 222, 224, 225, 226, 227, 277, 314

socioeconomics, 133

species, x, 30, 33, 40, 101, 122, 123, 124, 126, 127, 129, 133, 138, 141, 145, 219, 244, 277, 278, 279, 282, 285, 286, 287, 291

strictly protected, 26, 41, 160, 236

sustainability, vi, xiii, 19, 21, 27, 30, 33, 42, 49, 56, 68, 89, 163, 211, 212, 213, 215, 216, 228, 229, 247, 269, 293, 299, 308, 313, 314

sustainable development, x, xi, xii, xiv, 6, 26, 44, 64, 101, 106, 115, 139, 160, 187, 212, 213, 214, 215, 216, 217, 221, 222, 226, 227, 229, 230, 247, 253, 254, 255, 297, 298, 300, 301, 313, 318

sustainable development areas, 101, 187

sustainable livelihoods, 107

sustainable tourism, ix, xii, 5, 17, 20, 26, 27, 30, 31, 41, 43, 63, 64, 68, 92, 123, 154, 176, 211, 213, 220, 221, 222, 226, 228, 229, 234, 287, 290, 294, 298, 314, 315, 316

sustainable use, 5, 6, 23, 26, 28, 34, 40, 41, 83, 110, 160, 218, 239, 252, 293, 299, 302

sustainable use areas, 5

systematic conservation planning, 145, 156

T

Tapajós National Forest, 110, 180, 188, 190, 191, 205, 206, 207, 209

territory, 68, 69, 122, 133, 144, 220, 233, 234, 235, 240, 256, 269, 298, 299, 302, 304, 313

Tijuca National Park, 16, 40, 58, 119, 123, 166

tools, 3, 14, 31, 33, 72, 73, 100, 112, 140, 180, 181, 183, 185, 187, 192, 200, 204, 208, 209

tour packages, 36

tourism journals, 25, 31, 32, 36, 39, 41

tourism with botos, 276, 277, 283, 284, 285, 287, 288, 289, 291

trails, 7, 10, 11, 12, 15, 16, 17, 18, 19, 21, 22, 23, 33, 72, 74, 82, 83, 84, 86, 112, 140, 141, 142, 143, 145, 149, 150, 151, 154, 155, 173, 183, 184, 190, 192, 193, 194, 207

training, 9, 33, 37, 38, 41, 112, 126, 130, 132, 176, 180, 181, 182, 184, 188, 192, 194, 195, 199, 200, 206, 207, 218, 245, 248, 251, 287, 303, 305

tropical forests, 106, 111

U

uncertainty, 101, 102, 108, 183

United Nations, 65, 181, 215, 231, 253, 294, 318

United States, vi, 10, 20, 89, 91, 112, 117, 118, 128, 134, 135, 136, 138, 159, 282

universities, xii, 32, 53, 100, 109, 113

urban, 26, 40, 101, 119, 214, 235, 254, 256, 280, 289, 301, 311

V

vegetation, 4, 13, 142, 144, 150
 viewpoint, 4, 145, 149, 256
 viewshed, vi, 139, 140, 141, 142, 144, 145, 146, 148, 151, 153, 154
 visibility, 32, 140, 144, 147, 149, 150, 153, 298, 311, 312, 313
 visitation, x, xi, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 15, 18, 20, 21, 25, 29, 31, 34, 38, 48, 49, 52, 53, 54, 56, 57, 58, 59, 60, 65, 68, 70, 71, 72, 79, 80, 82, 84, 85, 87, 88, 89, 100, 111, 129, 137, 140, 145, 154, 169, 175, 177, 180, 184, 188, 189, 190, 192, 237, 261, 263, 265, 285, 289, 291
 visitation management, 25, 31, 289
 visitor impact, 3, 4, 5, 8, 17, 18, 20, 21, 91, 112, 124, 190
 visitor impact management, 3, 4, 8, 17, 18, 91
 visitor monitoring, 7, 158, 169
 visitor perceptions, 161
 visitor satisfaction, 60, 158, 170, 171
 visitors, xiv, 3, 4, 7, 9, 10, 11, 13, 15, 18, 22, 23, 34, 40, 56, 58, 59, 60, 67, 68, 69,

70, 71, 73, 76, 77, 80, 82, 83, 84, 86, 87, 88, 89, 90, 93, 115, 118, 120, 123, 124, 125, 129, 134, 137, 140, 157, 158, 161, 162, 165, 166, 167, 168, 169, 170, 172, 173, 177, 180, 183, 188, 189, 196, 198, 204, 205, 233, 234, 235, 237, 239, 262, 264, 265, 266, 267, 268, 269, 270, 271, 276, 277, 284, 285, 288, 290, 295, 298, 302, 305

W

water, 92, 140, 142, 174, 196, 221, 223, 236
 waterfall, vi, 148, 149, 157, 158, 163, 164, 165, 166, 167, 168, 169, 170, 172, 173, 175, 220
 white-tailed deer, 122, 129, 133
 wild animals, 123, 126, 281
 wildlife, 6, 9, 13, 30, 33, 36, 42, 119, 126, 129, 133, 135, 137, 160, 186, 276, 277, 287, 293, 311
 wildlife tourism, 36, 277
 wildlife watching, 30, 36, 42, 129