

MATA ATLÂNTICA 2012

YEARBOOK

**OVERVIEW ON THE COMPLIANCE WITH THE AICHI
TARGETS (CBD) 2011- 2020 IN THE MATA
ATLÂNTICA BIOME**

ADVANCES, TRENDS AND CHALLENGES





**OVERVIEW ON THE COMPLIANCE WITH THE AICHITARGETS
(CBD) 2011- 2020 IN THE MATA ATLÂNTICA BIOME**

ADVANCES, TRENDS AND CHALLENGES

TECHNICAL TEAM

GENERAL COORDINATION

Clayton Ferreira Lino (*President of the Friends of the Instituto Amigos da Reserva da Biosfera da Mata Atlântica*)

EXECUTIVE COORDINATION

João Lucílio R. de Albuquerque (*Executive Secretary of the Instituto Amigos da Reserva da Biosfera da Mata Atlântica*)

TECHNICAL COORDINATION

Heloisa Dias (*Technical Coordinator of the Instituto Amigos da Reserva da Biosfera da Mata Atlântica*)

CONSULTING

Wigold Bertolo Schaffer
Miriam Prochnow
Ícaro Cunha
Rodrigo Bandeira
Mario Oscar Cencig
Patrícia Ferreira e Lima
Nilson Máximo

VISUAL PROGRAMMING AND COMMUNICATION

Felipe Sleiman Rizzatto
Danilo Costa Silva

TECHNICAL SUPPORT

Ana Lopez
Bethania Fichino
Marcelo Amaral
Marcéu Pereira
Pedro Castro
Raquel Corrêa
Fernando P. Santos
Luan Vasco de Farias

LOGISTIC SUPPORT

Ângela Marta Candido
Leiz da Silva Rosa
Vitor Simões

ADMINISTRATIVE AND FINANCIAL SUPPORT

Fernando Cesar Capello (*Coordenador Administrativo Financeiro do Instituto Amigos da RBMA*)

FOCAL POINTS AND COLLABORATORS FOR THE MATA ATLÂNTICA YEARBOOK PROGRAM

Rio Grande do Sul

Alexandre Diehl Krob
Joana Braun Bassi
Maria Isabel Chiappetti

Santa Catarina

Eduardo Mussatto

Paraná

Mariese Cagnin Muchailh
Paulo Pizzi

Mato Grosso do Sul

Flavia Neri Moura
Leonardo Tostes Palma

São Paulo

Luis Alberto Bucci
Rodrigo Castanho

Rio de Janeiro

Ana Claudia Paraense
Carol Marques
Lara Montinho da Costa

Espírito Santo

Iara Gardênia Moreira
Roberta de Souza

Minas Gerais

Ivan Seixas Barbosa
Janaina Mendonça
Manno Andrade
Marcos Ortiz
Simone Ribeiro

Goias

Fabiano Rodrigues Melo

Bahia

Jean Francois Timmers
Milene Maia
Renato Cunha

Sergipe

Paulo Cesar Umbelino de Oliveira
Valdineide Barbosa de Santana...

Alagoas

Afrânio Menezes
Alex Nazário
Esdras Andrade

Pernambuco

Bruno Paes
Elba Borges
Maria das Dores Melo
Maria Vileide de Barros Lius

Paraíba

Boisbaudran Imperiano
Irecê Maria

Rio Grande do Norte

Maria Fátima Rego
Mary Sorage

Ceará

Ednaldo Viera do Nascimento
João Bosco Carbogin
Leinad Carbogin
Maria Teresa Farias de Menezes

Piauí

Tânia Maria Martins Santos

Região Marinha

Flavio Lima Silva
Hudson T. Pinheiro
João Batista Teixeira
José Martins da Silva Jr.
Kleber Grubel da Silva
Roberto Sforza

Members of the CN-RBMA

Members of the Regional Collegiates
Members of the State Committees and
Sub-committees

Execution:




Sponsor:



Support:



An aerial photograph of a lush green forest. A single, large tree with bright yellow foliage stands out prominently in the center of the frame, surrounded by a dense canopy of green trees. The forest extends to the edges of the image, showing a variety of tree heights and colors.

Publishing this document in Rio +20, the Mata Atlântica Biosphere Reserve - RBMA at the same time celebrates two decades of their contribution to conservation, knowledge and development of this magnificent biome, and starts a new phase of its Mata Atlantica Yearbook Program.

The “Mata Atlântica Yearbook” is a permanent program of the Mata Atlântica Biosphere Reserve, created in 1999 with the aim to consolidate, update and provide systematically and periodically information about the Mata Atlântica biome, in order to facilitate annual and multiannual comparisons on progress and challenges in the conservation, scientific and traditional knowledge and sustainable development in the forest, supporting projects and public policies.

To develop this ongoing process of evaluating and monitoring the Mata Atlântica Yearbook Program from RBMA is based on the text and the goals of the Convention on Biological Diversity - CBD, adopted at the UN Conference on Environment and Development (UNCED), Rio 92, where Brazil was the first signatory. The convention, which represents the most comprehensive and important commitment on a global scale for the conservation, sustainable use and sharing of benefits of biodiversity, is governed by the so-called Conference of the Parties (Conference of the Parties - COP) that brings together all signatory countries, meeting every two years.

At the meeting of the COP 10 held in Japan in 2010, in Nagoya, Aichi province, it was approved a Strategic Plan defining five goals and 20 targets, called Aichi Targets to be accomplished by all countries by 2020. Each country should adapt them to their national realities and establish their own targets. The hope is to obtain a comparative evolutive data in a planetary scale of the implementation of the Convention of Biological Diversity.

Among these targets is, for example, a commitment that by 2020 all countries have, at least, 17% of its land area and inland waters and 10% of coastal and marine areas preserved by Protected Areas effectively implemented.

Other targets, for example, are focused on the sustainable use of fisheries resources, protection of endangered species, invasive species control and restoration of degraded areas. The plan also states that these targets should be implemented and monitored in a participatory way.

Thus, from the Nagoya Conference, the RBMA has determined that the main focus of its Mata Atlântica Yearbook Program would be the monitoring and dissemination of results of compliance or not, of the Aichi Targets - CBD 2020 in the richest and one of the most threatened Brazilian biomes.

This is the biggest challenge of the Project Mata Atlântica Yearbook: Monitoring the Aichi Targets - CBD 2020 started in 2011 by the RBMA Network, which involves about 250 institutions, governmental and nongovernmental, in 17 Brazilian states, and strategic partners.

This project aims to do in an integrated way with the national policy, coordinated by the Ministry of Environment, the monitoring and the evaluation of the compliance with these targets, observing the biome. More than that, it intends to create mechanisms and encourage actions, at National and Subnational level, in order to comply with and implement Aichi Goals and Targets in the Mata Atlântica Domain and its adjacent marine regions.

The starting point for this monitoring was the document "Assessment of Compliance with the CBD 2010 targets for the Mata Atlântica biome," (CF Lino and Simões. L, 2010) prepared by the partnership between WWF and RBMA, with the collaboration of various institutions and researchers working in this area, presented at COP 10 and now available on the site of the RBMA (www.rbma.org.br)

To develop this study, the National Council of RBMA with the collaboration of 43 focal points in the 17 states covered the RBMA Network, involving members of the RBMA State Committees, Regional Collegiate and specialized consultants in several themes. Thus, besides the pioneering to be the first biome in global assessment to begin its evaluation attending to the Strategic Plan of the CBD 2020. Attending to this the Mata Atlântica will have a document made by a decentralized and participatory way, that will be a reference for its permanent monitoring.

With the expected definition of "national biodiversity targets" this year, from 2013 the "Mata Atlântica Yearbook is also going to include evaluation of standardized indicators from national level and, where available, the monitoring of these targets in each state of the Mata Atlântica Biosphere Reserve.

It is a collective construction process that it was only possible by the collaboration of members and partners of RBMA, the major sponsor of VALE, the support of the Avina Foundation, and the project "Protection of the Mata Atlântica", which includes the technical support of GIZ, financial support of KfW, on charge of the Ministry of the Environment, Nature Conservation and Nuclear Safety of Germany (BMU). To all of them we reiterate our thanks..

Clayton Ferreira Lino
President of the National Council of
The Mata Atlântica Biosphere Reserve



SUMMARY

CONVENTION ON BIOLOGICAL DIVERSITY (CBD)	07
THE MATA ATLÂNTICA	11
OVERVIEW ON THE COMPLIANCE WITH THE AICHI TARGETS (CBD) 2011- 2020 IN THE MATA ATLÂNTICA BIOME– ADVANCES, TRENDS AND CHALLENGES	14
Strategic Goal A	16
The perception of society and the government on biodiversity.....	17
Risk of setback.....	21
The society in the struggle for progresses.....	22
Monitoring and mapping show the reality of the Mata Atlântica.....	23
Sustainable products of the Mata Atlântica.....	23
Access to information helps raising awareness on the importance of preserving the biodiversity.....	24
Conclusions and recommendations.....	25
Strategic Goal B	26
Mapping and monitoring.....	27
Vectors of deforestation.....	30
The Mata Atlântica and the mitigation of climate change effects.....	30
Forest Certification.....	31
The Mata Atlântica and the coastal and marine zone.....	32
Invasive exotic species.....	34
Conclusions and recommendations.....	36
Strategic Goal C	38
Brazilian laws support the goals and targets of the CBD in the Mata Atlântica.....	40
The biodiversity of the Mata Atlântica.....	42
Preservation Units in the Mata Atlântica.....	43
Conclusions and recommendations.....	49
Strategic Goal D	50
The importance of biodiversity and ecosystem services.....	51
Restoration of Permanent Protected Areas and Legal Reserves.....	52
The importance of the NGO's work in the forest restoration.....	54
The work of the states in forest restoration.....	54
Payment for Environmental Services (PSA).....	55
Relationship between ecosystem services and disasters.....	57
Access to Genetic Resources and the Fair and Equitable Sharing of the Benefits Arising from their Utilization.....	58
Conclusions and recommendations.....	60
Strategic Goal E	62
Biodiversity and public policies.....	63
The participation of the states on CBD.....	65
The importance of scientific knowledge.....	66
Traditional Knowledge and biodiversity.....	68
Mobilization of national and international resources.....	68
Mata Atlântica restoration fund.....	70
National Program for the Preservation and Recovery of the Mata Atlântica.....	70
Municipal plans for the preservation and recovery of Mata Atlântica.....	70
Conclusions and recommendations.....	72
Bibliography References	78
Tables of Acronyms	84

An aerial photograph showing a large, calm body of water in the foreground, surrounded by a dense, lush green forest. The water reflects the sky, and the forest extends to the edges of the frame. The text 'CONVENTION ON BIOLOGICAL DIVERSITY (CBD)' is overlaid in the top left corner.

CONVENTION ON BIOLOGICAL DIVERSITY (CBD)



The biodiversity currently found on Earth is the result of millions of years of evolution. Therefore, in addition to its value or potential to provide services and products to mankind, the diversity of species, ecosystems, and genetics comprises an intrinsic value of existence, which must be respected and preserved.

The Convention on Biological Diversity (CBD) was approved during the Rio-92 to help preserving the biodiversity. As the event's host and holder of the largest biodiversity on the Planet, Brazil was the first signatory of the convention, ratified by the National Congress in 1994 and enacted by Decree 2,519 dated March 16, 1998. The CBD is the agreement for international collaboration executed by the nations for the preservation of the biological diversity, sustainable use of its components, and the fair and equitable sharing of the benefits arising from the use of genetic resources, through adequate access to genetic resources and the appropriate transfer of applicable technologies, considering all rights on such resources and technologies, and upon adequate financing ("Convention on Biological Diversity - CBD", 1992).

The CBD is ruled by the Convention of the Parties (COP), which has met 10 times. The COP 6, held in The Hague, The Netherlands, in May 2002, established the first set of targets for the 2002-2010 period, known as the "2010 Target", authorized by the World Summit on Sustainable Development held in Johannesburg, South Africa, in September 2002. The COP 6 also set a strategic plan to direct the implementation of the "2010 Target" on a national, regional, and global level so as to mitigate the loss of biodiversity and secure the continuity of the benefits and their equitable distribution, besides creating the Global Strategy for Plant Conservation (GSPS), seeking to stop, in the long term, the current and continuous loss of plant biodiversity through a set of sixteen global targets.

In February 2004, in Kuala-Lumpur, Malaysia, the COP 7 approved the "Strategic Plan: future progress evaluation", a framework of global targets and indicators to guide and monitor the implementation of the CBD Target for 2010. A

COP 8, held in Curitiba, Paraná, Brazil, in March 2006, updated and completed the framework of targets and indicators.

Unfortunately, the evaluations indicate that the 2002-2010 Strategic Plan was not effective, and according to the Overview on Global Biodiversity¹, the target agreed by the world governments was not met.

In fact, the opposite took place:

- species that had been considered in risk of extinction are, in general, closer to extinction;
- the abundance of vertebrate species, based on the population assessed, has dropped nearly one third, between 1970 and 2006, and keeps dropping, especially in neotropical regions;
- areas of natural habitat continue to drop in extension and integrity, despite a few achievements in reducing the pace of destruction;
- the agricultural biodiversity is still being lost;
- the five main direct causes of the loss of biodiversity² are still in the same level or getting worse; and
- the ecological footprint of mankind, in other words, the environmental impacts on the planet continue to grow exponentially.

Based on the global rules of the CBD, in 2006, Brazil established 51 national biodiversity targets for 2010, some of which are more ambitious than those in the Convention. The national targets were approved by the National Biodiversity Committee (CONABIO) in 2006, and published through the CONABIO Resolution No. 3. The CONABIO is the collegiate body with a deliberative and consultive nature that coordinates the implementation of the commitments assumed by the country under the Convention on Biological Diversity, as well as the principles and guidelines of the National Biodiversity Policy – PNB.

In general, the reach of the Brazilian targets also presented problems and many were not met, in spite of very significant progress such as the increase of the area under the protection of preservation units and a drop in deforestation. Of the 51 national targets for 2010, at least 34 (67%) were 25% or less successful (BRAZIL/MMA, 2010). Two of these targets were fully

achieved: a reduction of 25% in the hotspots and the availability of species lists in permanent databases.

The Nagoya Protocol and the 20 Aichi Targets, which are important instruments for evaluating the compliance with the commitment assumed by the countries, were executed in the COP 10, held in Japan in October 2010. Brazil played a key role in defining the Aichi Targets, which despite their ambitiousness, are concerned with their feasibility.

The overview on the compliance with the Aichi Targets in the Mata Atlântica is the focus of this publication. This overview is developed under the Mata Atlântica Annual Report of the Mata Atlântica Biosphere Reserve (RBMA), which defined a specific project to monitor the targets and indicators comprised in the Target Plan for 2020 in the biome. The strategy of this monitoring is to directly involve the RBMA management system, which is decentralized in the 17 states covered by the Mata Atlântica. The project aims at motivating

1 CONVENTION ON BIOLOGICAL DIVERSITY SECRETARIAT, 2010a, p. 8.

2 Loss of habitat, overexploitation, pollution, exotic invasive species and climate changes.



the public spheres (Federal, State, and Local), non-governmental organizations, private companies and other sectors in the civil society to improve advances in the 5 goals and 20 targets undertaken by Brazil before the Convention on Biodiversity (CBD) and to observe the commitments assumed by Brazil in the COP 10, held in October 2010 (Nagoya, Japan), for the Mata Atlântica and adjacent coastal and marine areas.

The starting point of the project Mata Atlântica Annual Report: Monitoring of the 2011-2020 Aichi Targets (CBD) is the document on the evaluation of compliance with the Metas 2010 da CDB para o Bioma Mata Atlântica (2010 Targets of CCB for the Atlantic Forest Biome), prepared jointly between the WWF and the RBMA and the document Metas de Aichi: Situação atual no Brasil (Aichi Targets: Current Situation in Brazil), prepared by the UICN, WWF-Brasil and IPÊ in 2011



THE MATA ATLÂNTICA





In addition to be one of the most important biodiversity hotspots on the planet, the Mata Atlântica, is recognized as a “national heritage” by the Federal Constitution. It is the second largest complex of rainforests in size in South America and is predominantly located in the Brazilian territory, also extending to part of the Argentinean and Paraguayan territories. The different types of vegetation that comprise its area of reach are defined by Law 11.428/2006 and Decree 6.660/2008, which sets forth the conditions for the preservation, protection, regeneration, and use of the vegetation present in the area delimited as Mata Atlântica the map of the “Area of Application of Law 11.428 of 2006”, of the Brazilian Geographical and Statistics Institute (IBGE)¹ (Figure 1). The legal framework is supplemented by the Resolutions of the National Environment Council (CONAMA), which define the primary and secondary vegetations and set the technical parameters for their identification. According to these legal provisions, the Mata Atlântica covers about 1,306,421 square kilometers, i.e. 15% of the Brazilian territory, spreading totally or partially throughout the territory currently occupied by 3,517 municipalities in 17 Brazilian states (Table 1), where about 120 million inhabitants reside and the largest metropolises in the country (MMA 2010) are located.

Distributed along more than 23 degrees of south latitude, it is comprised of a series of phytogeographies (types of vegetation), which caused a significant environment diversification and allowed for the evolution of a vegetal and animal biotic complex with a high density of species diversity, being considered one the richest groups of ecosystems in biological diversity in the world

¹ According to the “Map of the Area of Application of Law 11.428, of 2006” of the IBGE, the Mata Atlântica comprises a group of forest formations and associated ecosystems, as well as interior forest enclaves and altitude swamps: dense rainforest; mixed rainforest, also named araucarias forest; open rainforest; semideciduous seasonal forest; deciduous seasonal forest; altitude fields; pioneer formation areas, known as swamps, sandbanks, salt fields and alluvial areas; vegetation refuges; ecological tension areas; interior altitude swamps and forest enclaves, represented by disjunctions of dense rainforest, open rainforest, semideciduous seasonal forest and deciduous seasonal forest; steppes, savanna and steppe-savanna areas; and native vegetation of coastal and oceanic islands.

The number of municipalities was calculated from the Map of the Area of Application of Law 11.428/2006, based on IBGE data from 2009, and includes all municipalities with part or all of their territories incident on the boundaries of the Mata Atlântica. The states are: Alagoas, Bahia, Ceará, Espírito Santo, Goiás, Minas Gerais, Mato Grosso do Sul, Paraíba, Paraná, Pernambuco, Piauí, Rio de Janeiro, Rio Grande do Norte, Rio Grande do Sul, Santa Catarina, São Paulo, and Sergipe.

The history of European colonization in Brazil, starting in the year 1500, was ruled by the predatory appropriation of natural resources. In a continent-sized country holder of several and exuberant ecosystems, the economic development was implemented and maintained for centuries without concern or care for the environment. All great economic cycles such as the exploration of pau-brasil, the growing of sugar cane, and the beginning of gold extraction, followed by the coffee and industrialization cycles, were based on the logic of the highest gain in the shortest term, resulting in a strong conversion of natural environments, a more intense phenomenon along the coast, a space originally occupied by the Mata Atlântica, where the first colonizers settled.

The Mata Atlântica is currently responsible for about 70% of the Brazilian GDP, especially in the manufacture, agriculture, and service industries. The Mata Atlântica also houses hundreds of traditional communities, including about 100 indigenous areas

and hundreds traditional communities including quilombos, traditional fishermen communities, caiçaras, and faxinalenses communities, among others, with a rich culture associated to this social diversity. These people and house farmers use many products of the forest, in particular non-wood, creating work and income for their families.

This shows the relevance of preserving the biodiversity in the Mata Atlântica region and also to search for a sustainable development able to preserve natural resources and ecosystem services, and therefore create economic development and ensure quality of life to this high population number.

It will be present below the current overview of the Mata Atlântica in relation to each of the 5 goals and 20 targets of the CBD for 2020, and without covering the issue excessively, it will provide some conclusion and recommendations so that these goals and targets are actually achieved.

Original Mata Atlântica Area by State (UF)			
UF	Área UF em Km2	Original Mata Atlântica by State	
		Km2	%
AL	27.933	14.529	52,01
BA	567.295	177.924	31,36
CE	146.348	4.878	3,33
ES	46.184	46.184	100,00
GO	341.290	10.687	3,13
MS	358.159	51.536	14,39
MG	588.384	281.311	47,81
PB	56.585	6.743	11,92
PE	98.938	17.812	18,00
PI	252.379	22.907	9,08
PR	199.709	193.011	96,65
RJ	43.910	43.291	98,59
RN	53.307	3.298	6,19
RS	282.062	132.070	46,82
SE	22.050	7.153	32,45
SC	95.443	95.265	99,81
SP	248.809	197.823	79,51
Total	3.428.783	1.306.421	38,10

Table 1. Original area of the original Atlantic Forest in each of the 17 states

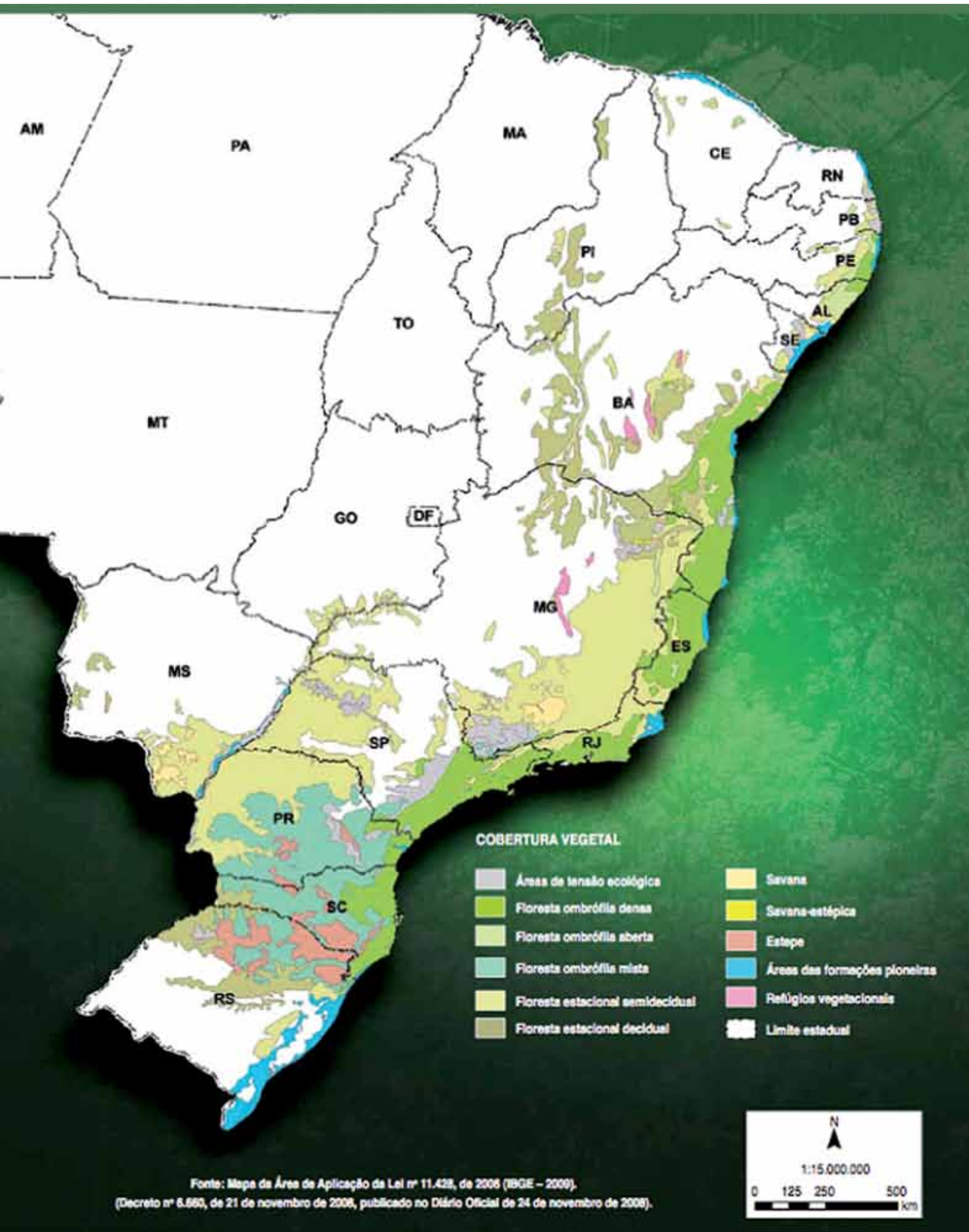


Figure 1. Map of the Area of Application of Law 11.428/2006 of the IBGE.



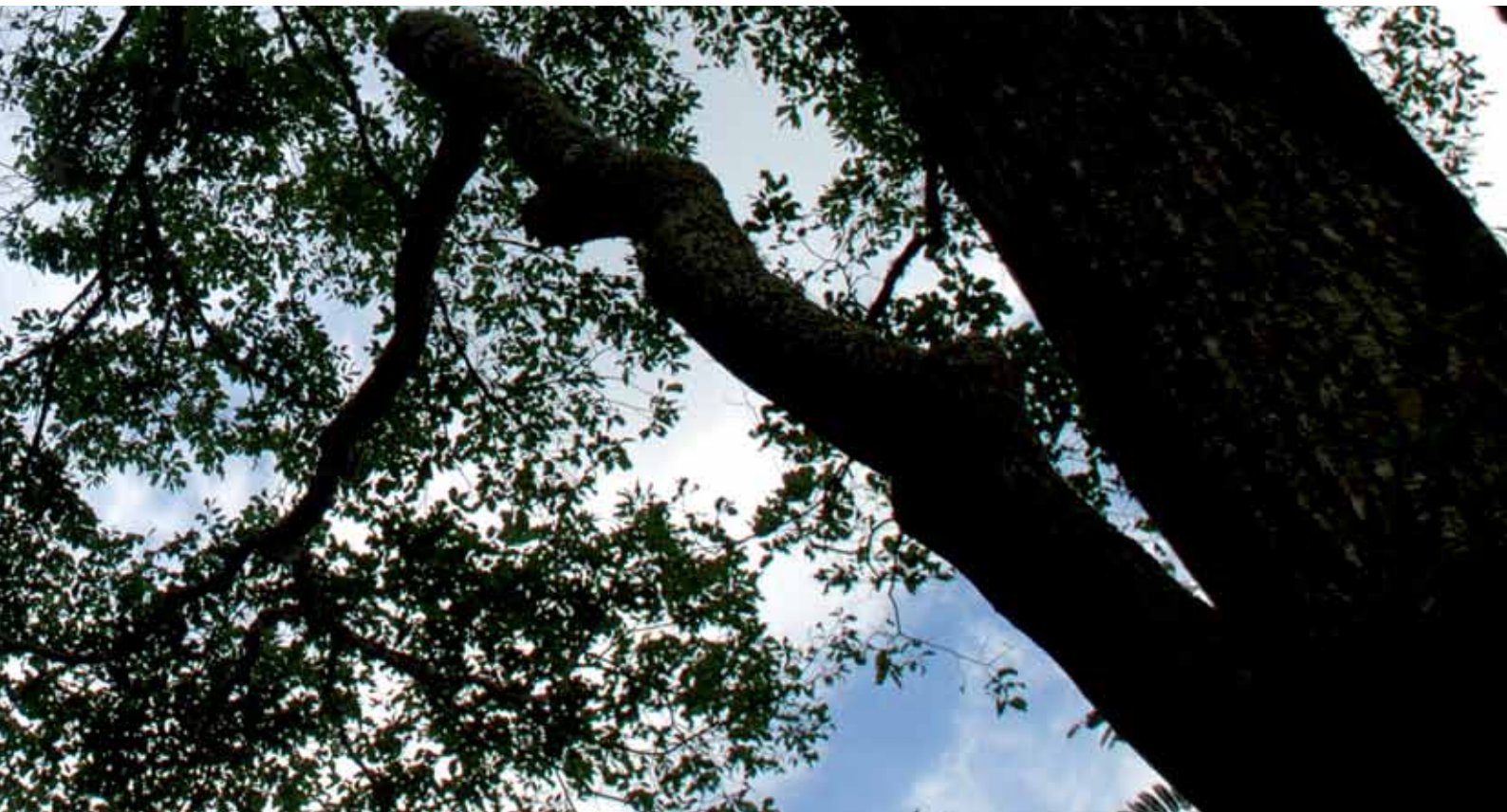
**OVERVIEW ON THE COMPLIANCE WITH THE AICHI TARGETS
(CBD) 2011-2020 IN THE MATA ATLÂNTICA BIOME**

ADVANCES, TRENDS AND CHALLENGES





As we have seen, the Aichi Target Plan is made of 5 goals and 20 global targets to be adjusted by each country through the definition of National Biodiversity Rules. Brazil is working in this sense and the national targets will be established still in 2012. Thus, this overview addresses the Strategic Aichi Targets and an analysis on the current scenario, trends, and challenges to their compliance in the Brazilian Mata Atlântica.



STRATEGIC GOAL A: ADDRESS THE UNDERLYING CAUSES OF BIODIVERSITY LOSS BY MAINSTREAMING BIODIVERSITY ACROSS GOVERNMENT AND SOCIETY

- **Target 1** - By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.
- **Target 2** - By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.
- **Target 3** - By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.
- **Target 4** - By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.



This goal concerns the production and provision of knowledge and the mobilization of national forces so that the government, in a wide sense, as well as the society in general, understand the importance and the value of biodiversity and assume commitments in public policies and in daily actions in search of sustainable development.

To deal with the fundamental causes of the loss of biodiversity, the knowledge and the raising of awareness as to its importance and value are essential. Well-informed people are able to mobilize and influence individual and collective decisions, from small choices of consumption to big decisions on public policies and investments. A greater knowledge of the values of biodiversity supposedly leads to better decisions, although being aware that knowledge is not the only factor to influence the decisions, and even consistent values, since people tend to have values consistent with their interests. Even knowledge has its changing potential limited by individual priorities, which tend to prioritize information that reinforce their individual priorities and deny those whose acknowledgement may bring them losses or, even if apparently reduce. Therefore, the preservation of biodiversity also depends on a synergy of interest in society, which positively stresses out the interdependence between people and biodiversity¹.

THE PERCEPTION OF SOCIETY AND THE GOVERNMENT ON BIODIVERSITY

There is currently certain unanimity in the environmental speech and even the biggest depredators publicly state that they are pro-environment. However, in the everyday practice, a large number of people believe that preserving the environment is important as long as it does not interfere in their territory, endanger their benefits or the profitability of their businesses. The change to this position therefore goes through a deep transformation in the fields of culture, economy and the institutional legal picture so that the current incentives to the predatory use of the territory and its resources and the irresponsible consumption are reduced, at the same time valuing the concept and the practice of sustainability. In this scenario, it is critical to have available information on the importance of biodiversity and the environmental

¹ UICN, WWF-BRASIL and IPÊ. Metas de Aichi: Situação atual no Brasil. Ronaldo Weigand Jr; Danielle Calandino da Silva; Danielade Oliveira e Silva. Brasília, DF: UICN, WWF-Brasi e IPÊ, 2011.

services it provides, as well as acknowledgement of the hazardous effects of depredation and misuse of the ecosystems and the territory to the whole to society.

An example of misunderstood and unresolved interdependence in many areas of the Mata Atlântica is the cause/effect relationship of the occupation of fragile and risk areas subject to flooding and landslides. Most of the people that reside in these places do not understand or do not accept (due to interest or need) that while they continue to live in these areas they will remain subject to financial losses and even death. What is even more serious is that when tragedies come, the authorities usually want to be seen as saviors by releasing financial aid and performing merely palliative works, without attaining to the actual causes. Likewise, in most cases, the media coverage on such tragedies deals addresses the matter in a superficial manner and does not indicate the cause of the problem, which is the undue occupation, most illegally. The Legal Scholar and current Minister of the Superior Court of Appeals, Antonio Hermann Benjamin, raises awareness to this matter: "the occurrence

of torrential rains and the resulting elevation of the water level in rivers and streams is natural, has always happened and will continue to. That is, where a flooding once took place, sooner or later it will again. If we know this, the most intelligent – and costless – action is to prevent. There is no more effective formula than to respect the risk areas and stop occupying them"².

National polls show that Brazilians are, in general, informed on biodiversity and the main environmental issues of nowadays. In the poll "What do Brazilians think of biodiversity?"³, idealized by the Ministry of the Environment, jointly with WWF-Brasil, Funbio (National Biodiversity Fund), Natura, conducted in 2006 by the Vox Populi Institute and coordinated by the ISER (Religion Studies Institute), the depredation of forests was considered "very serious for Brazil" by 76% of the 2,200 interviewees

2 Mata Atlântica - Patrimônio Nacional dos Brasileiros - Prefácio. MMA, 2010

3 What do Brazilians think of biodiversity? <http://www.wwf.org.br/informacoes/biblioteca/?3640>

Destruction of Forests

- Very Serious
- Serious
- Other Answer

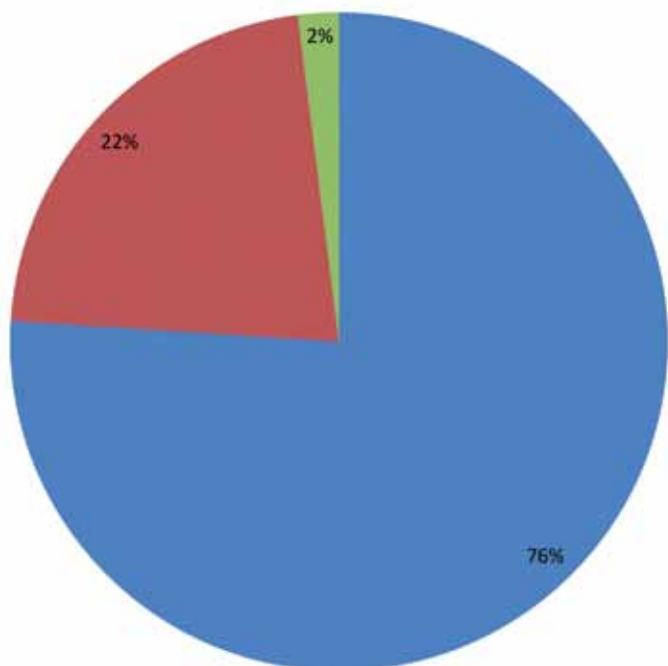


Figure 2. Chart showing the opinion of Brazilians on forest destruction

Main environmental problem of Brazil

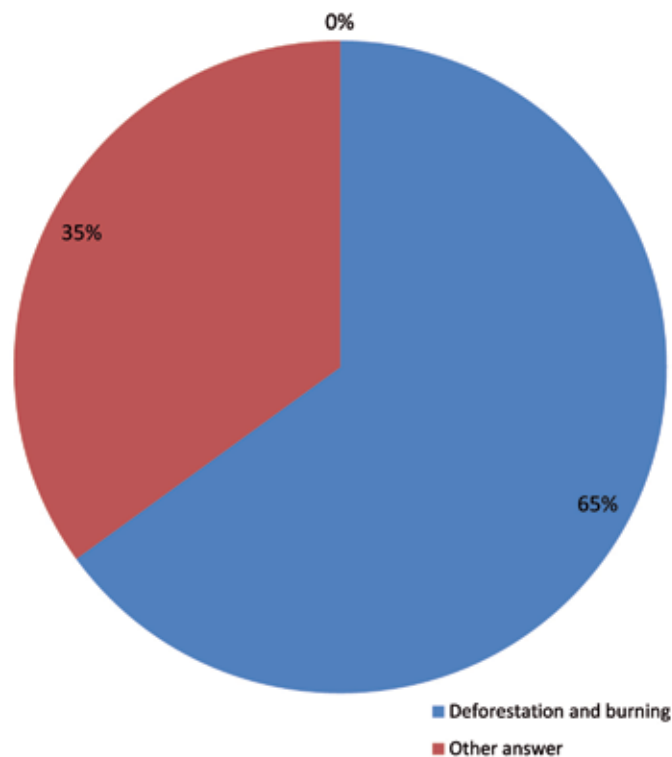


Figure 3. Chart showing the main environmental problem of Brazil, according to the poll "What do Brazilians think of biodiversity" (MMA, WWF, Funbio, Natura, Instituto Vox Populi, and ISER)

(Figure 2) (+16 years old, residents of urban and rural areas). When this percentage is added to those that considered the problem "serious", this index rises to 98%. Deforestation and forest fires appear as Brazil's main environmental problems, with 65% of quotes (Figure 3), followed by the pollution/contamination of rivers, lakes, and lagoons, with 43%. Among the most threatened biomes were the Amazon (38%) and the Mata Atlântica (18%). Climate changes, which in 2001 appeared as "problem affecting a big part of the world" to only 23% of the interviewees, have reached 43% in 2006. The problem is considered serious or very serious by 76% of Brazilians.

The 2006 poll focused on biodiversity, but presented a comprehensive panel on the Brazilian population's opinion, knowledge, and attitude before related issues. Regarding the concept of biodiversity, it was known by 43% of the interviewees. Among them, the level of awareness reaches 84% between those with higher education. More recent polls show that this awareness has been increasing in the Brazilian public opinion, integration forest preservation to the growing concern with climate changes.

The CNI/Ibope poll "Portraits of the Brazilian society: Environment"⁴, published on 05.04.2012, indicated that 65% of the population considers the climate change a very serious problem that must be addressed immediately. In 2009, the index was only 47% (Figure 4). The majority (79%) associates the problem to actions of man and only 16% claim that it is due to a natural process of the Earth. The percentage of people that worry about the environment in general also increased from 80% in 2010 to 94% in 2011 (Figure 5). To 44% of the people interviewed the preservation must be prioritized over economic growth, while 40% say it is possible to conciliate both.

Deforestation is the most serious problem to 53% of those interviewed. Next is water pollution, mentioned by 44%, and climate changes, with 30%. However, more than 40% say that pro-environment

4 PORTRAITS OF THE BRAZILIAN SOCIETY: ENVIRONMENT
<http://www.cni.org.br/portal/data/pages/FF80808136AD2BEA01371940B71E-74DB.htm#Conteudo>

Climate Changes - An urgent problem to be faced

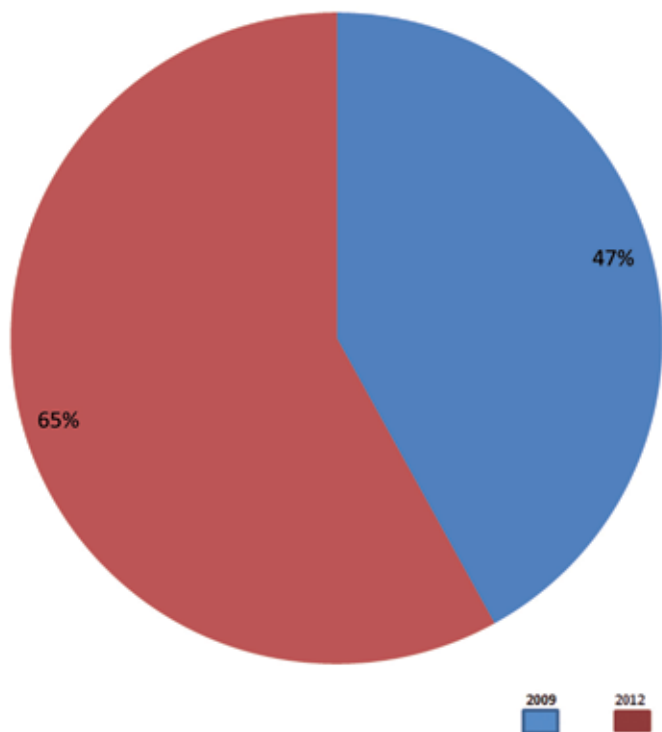


Figure 4. Chart showing the environmental issue to be immediately addressed by Brazilians, according to CNI/Ibope poll.

Population Concern for the Environment

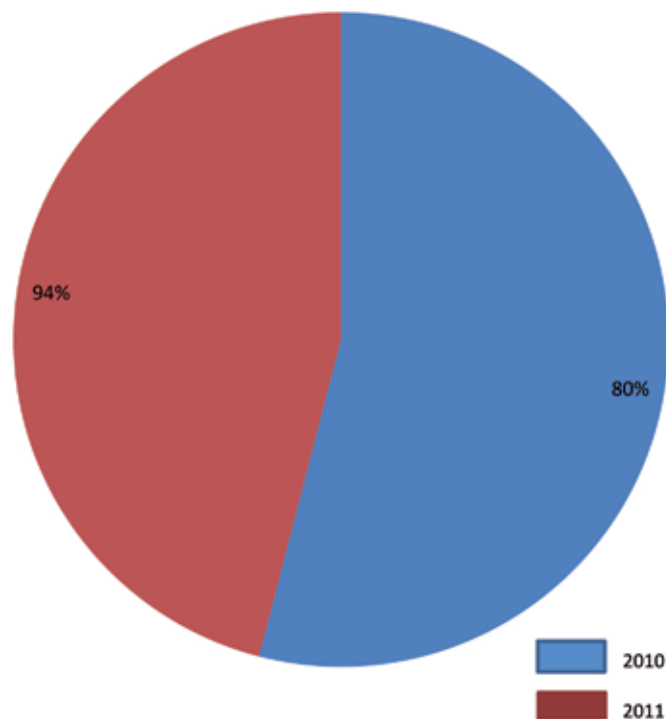


Figure 5. Chart showing the percentage of population that worries about the environment in 2010 and 2011

preservation initiatives were kept unaltered, whether by the government, companies, or the population itself. Out of the total, 71% claim to avoid wasting water and 58% try to save power. Although the majority (52%) is willing to pay more for environmentally correct products, only 18% give preference to “green” products or recyclable packages. More than half of

the population (59%) separates their waste and 67% consider recycling very important for the environment. Still, 48% claim to have no access to selective curbside collection (Table 2).

The results of these polls indicate that the population in general already know the importance

Poll (CNI/Ibope) – Portraits of the Brazilian society: Environment

Climate changes	Think climate changes are caused by problems related to the actions of man	79%
	Think climate changes are caused by a natural process	16%
Environmental preservation and economic growth	Think environmental preservation must be prioritized over economic growth	44%
	Think it is possible to reconcile both	40%
Environmental preservation and awareness-raising	Deforestation is the most unsettling problem	53%
	Water pollution is the most unsettling problem	44%
	Climate changes is the most unsettling problem	30%
	Think pro-environment preservation initiatives were kept unaltered in the last years	40%
	Avoid wasting water	71%
	Save power	58%
	Are willing to pay more for environmentally correct products	52%
	Give preference to “green” products or recyclable packages	18%
	Separate waste	59%
	Think it is important to recycle	67%
	Have no access to selective curbside collection	48%

Table 2. Population awareness of the environment and environmental issues

of the environment and biodiversity, and in addition to being concerned and more aware most of the population is also willing to do their share to solve these problems. It is worth stressing out that the majority of the people interviewed in these national polls live in the Mata Atlântica area, where about 2/3 of the Brazilian population reside.

RISK OF SETBACK

If on the one hand, the society has been showing a growing concern and mobilization towards preserving biodiversity and the environment in general, on the other hand, the National Congress and the Federal Executive Branch seem to have the opposite opinion of the absolute majority of Brazilians. A document released on 03.06.2012 by a group of NGOs and Social Movements⁵, organizations that support the non-destructive development and are concerned with the preservation of the social-environmental balance in the country, among which are the ISA, WWF, SOS Mata Atlântica, Imazon, and Ipam, indicates that “Brazil is currently facing an unprecedented setback in the social-environmental area, which precludes the country from advancing towards the sustainable development and seriously threatens the quality of life of the current and future population”.

The document notes that there has been damage to the functions of bodies such as the CONAMA and the reduction in the IBAMA’s inspection and licensing powers. Another problem identified, which directly reflects the conservation of the Mata Atlântica was the extinction of the Mata Atlântica Department of the Ministry of the Environment, created in 2000 as since then had dealt with issues related to the biome, and organize an annual National Week of the Mata Atlântica together with the NGO Network and the Atlantic Forest Mata Atlântica Biosphere Reserve.

Among the setbacks and issues indicated in the document is the discussion of the proposal of amendment to the Forests Code with no participation of the society, including scientists.

The text of the Forest Code approved in the National Congress and sanctioned with partial vetoes by the President of the Republic disfigures the forest protection laws and grants full amnesty to irregular deforestations committed until July 2008, instituting an impunity that will stimulate the deforestation. Besides granting amnesty to the recovery of the Legal Reserve for properties with up to 4 tax modes, to complete the setback the President enacted Provisional Measure 571/2012, also granting amnesty to the recovery of Permanent Preservation Areas (surrounding forests) in up to 80% in relation to previous parameters (30 to 500 meters in each margin of the river, depending on its width), changing it to 5 to 100 meter in each margin of the rivers in the whole country. Law 12,651, dated May 25, 2012, which replaced the 1965 Forest Code, besides decreasing the number of legal reserves and Permanent Preservation Areas in the whole country, contests technical studies by many of the best Brazilian scientists, who were shocked with the disregard to warnings given concerning the huge mistakes and evident abuses of the approved and sanctioned proposal. The changes approved in the Forest Code are particularly hazardous to the Atlantic Forest since they will jeopardize its possibilities of recovery.

Public statement about the new Brazilian Forest Code, published on 28.05.2012, by the Committee in Defense of Brazil in Defense of the Forests and Sustainable Development, which brings together more than 160 institutions socioenvironmental, and CNBB, CUT, OAB, Forum of Ministers of the ex-environment, institutions of small farmers and traditional communities, evaluate that “the Brazilian government has lost the opportunity to not succumb to the agricultural pressure and point to the sustainable social development.” The issue of MP 571/2012 returned to Congress to decide on the future of forests, which will be made only after the Rio +20, when the lagging sectors will certainly want to reduce even more protection. In this regard, the Committee in Defense of Brazil Forest cautions that “the mobilization of society must continue to press Congress and the Federal Government against amnesty for the deflorestersy.

5 RETROCESSOS DO GOVERNO DILMA NA AGENDA SOCIOAMBIENTAL
- http://www.socioambiental.org/banco_imagens/pdfs/SOBRE_OS_RETROCESSES_DO_GOVERNO_DILMA_final_6mar2012.pdf

The major threat to environmental legislation built in recent decades and the weakening of the institutional bodies responsible for coordination of protection, sustainable use and restoration of the Mata Atlântica reflects the current mismatch between the mobilization of society and public policy at the federal level. This mismatch is that of greater relevance in relation to the conservation of Atlantic Forest and other Brazilian biomes in the last two years, jeopardizing the desired progress in meeting the objectives of the CBD.

After several consecutive progresses, the halt in the climate changes agenda is also a concern. From 2005 to 2010, Brazil made decisive steps year after year to push forward the agenda of climate change in the national and international scenarios. This reinforcement hits its peak in 2009, with the agreed set of targets to decrease greenhouse gases incorporated into the Law of the National Policy on Climate Changes that backed the change of position of emerging economies. The regulation of the Law in 2010 sets forth the preparation of industry plans for a reduction in the emissions in 2011. However, 2011 witnesses a strong retraction of the agenda and none of the industry plans foreseen was finished or sent for public consultation

THE SOCIETY IN THE STRUGGLE FOR PROGRESSES

The participation and pressure of the society is essential to prevent the current ongoing setbacks and seek progresses in public policies. A successful example in the last two decades is the struggle of the Mata Atlântica NGO Network together with entities like Fundação SOS Mata Atlântica and the Mata Atlântica Biosphere among others to improve the legislation. These entities elected, as one of its main purposes the approval of a specific law for the Mata Atlântica finally signed in 2006. The Network, created during the Rio-92 representing today more than 300 affiliated NGOs, also plays the leading role in the permanent campaign for Zero Deforestation in the Mata Atlântica. In a regional level, it is worth mentioning, among others, the performance of the Northeastern Mata Atlântica Protection Association – AMANE and the campaign of the Piauí Environmental Network (REAPI), which together

with the Mata Atlântica NGO Network and other institutions have been promoting the campaign in defense of the Serra Vermelha, the last great forest of the Northeast, threatened by landgrabbers and miners working for steel companies, seeking to turn it into a National Park. The same thing happens in the south, southeast, and mid-west regions, with hundreds of NGOs and also governmental and academic bodies developing pro-Mata Atlântica projects and campaigns.

Some examples of campaigns and projects made are:

- Fauna das Gerais Campaign (Management for Protection of the Fauna, Flora and Bioprospecting of the Minas Gerais State Forest Institute);
- Project for the social-economic and environmental adjustment of rural properties – SEAPA-MG;
- Installation of Education Centers for the preservation of the Mata Atlântica biodiversity (Murici –AL/ Serra do Urubu –PE);

Recently, the Mata Atlântica NGO Network, the Fundação SOS Mata Atlântica and the Mata Atlântica Biosphere Reserve, together with other social-environmental networks and national institutions, as previously mentioned have been striving to stop the disassembly of the environmental legislation and the approval of the new version of the Forest Code. This is the reflex of a great involvement and mobilization of the society living in the Mata Atlântica region to value and protect the Brazilian biodiversity.

In the last couple of years the work to organize and acknowledge the Networks of Mosaics of Protected Areas also stood out, striving to diffuse and implement this instrument of integrated management of the territory.

Other social networks focused on managing protected areas in the Mata Atlântica and associated ecosystems are being organized and implemented, such as the Mata Atlântica Central Corridor Preservation Units Managers Network, the South and Northeast Preservation Units Managers Network, the Mata Atlântica Swamp Network, the Regional Collegiate Bodies and State Committees of the RBMA, and the Coalition Abrolhos Trindade and

the Connection Group associated to the RBMA, who have been working towards the preservation and sustainable use of the coastal and marine region.

MONITORING AND MAPPING SHOW THE REALITY OF THE MATA ATLÂNTICA

In the late 1980s, the SOS Mata Atlântica Foundation, the INPE (National Space Research Institute) and the Ibama entered into an agreement to hold the first mapping of the status Mata Atlântica's remain using satellite images. Since those days, many important progresses have been made in relation to analyzing the landscape and monitoring the evolution of the Mata Atlântica's native vegetation. This work⁶, which has been systematically updated and also improving in terms of scale, will be addressed in Goal 2.

Under the Project for Preservation and Sustainable Use of the Brazilian Biological Diversity⁷, all Brazilian biomes were mapped in a 1:250.000 scale with images from the year 2000 (Probio 2007).

The continuous monitoring of the Mata Atlântica vegetation for more than 20 years and the improvement in the quality of satellite images and methods of analysis have allowed for the production of essential information to better define preservation strategies. In this sense, due to the initiative of the Biodiversity and Forests Department of the Ministry of the Environment, a new project that will map all remains of primary and secondary native vegetation (forest and non-forest) in the entire area delimited in the Map of the Area of Application of Law 11.428/2006 is currently being implemented by the Funcate/INPE. This work, in the 1:50.000 scale, based on images of space resolution

6 The two editions of the Atlas of the Evolution of the Forest Remains and Related Ecosystems in the Mata Atlântica Domain, corresponding to the periods 1985-1990 and 1990-1995, present the first mappings made in this region, from analyses of TM/Landsat images in ten states covered by the Mata Atlântica, from Bahia to Rio Grande do Sul, respectively in the scales 1:1.000.000 and 1:250.000. The Fundação SOS Mata Atlântica and the INPE have also released another four Atlases, with the mapping in the scale 1:50.000, related to the periods 1995-2000, 2000-2005, 2005-2008, and 2008-2010.

7 The mapping made by the Project for Preservation and Sustainable Use of the Brazilian Biological Diversity (Probio) was an initiative of the Biodiversity and Forests Department of the Ministry of the Environment, the result of which was in the scale 1:250.000.

of 2.5 and 10 meters, is mapping every fragment of native vegetation larger than 3 hectares and should be completed in the second half of 2012.

SUSTAINABLE PRODUCTS OF THE MATA ATLÂNTICA

There have also been efforts to calculate, on a national level, the contribution of biodiversity to the economy, such as, for example, the study developed by the MMA and the United Nations Environment Program (PNUMA) about the economic contribution of preservation units to the national economy (MEDEIROS, R. et al., 2011), making available information such as the fact that the Brazilian preservation units have prevented carbon emissions equivalent to R\$ 96 billion per year.

Another example is the National Plan for the Promotion of Biodiversity Product Chains – PNPSB, where the MMA, MDA, MDS, and CONAB participate as managers in addition to partners such as state governments, the SEBRAE, the Mata Atlântica Biosphere Reserve, and members of the value chains in the regions where the Plan is active. The idea is to strengthen the value chains of the main products of the Brazilian social-biodiversity through the fostering of Local Production Agreements and tools such as minimum price guarantee, acquisition of food by the Government and inclusion of these products in school meals (institutional markets).

The Mata Atlântica was inserted through the inclusion of the piassava straw, explored in the northern coast of Bahia, in the ten priority chains of the National Plan, and later through the identification of other three very important chains, both from an economic and biodiversity preservation point of view: the jussara pulp, the pine nut and the mate. Currently, Local Production Agreements that work with these products are being developed, and concurrently the guidelines for the sustainable handling of each are being prepared to make sure that the governmental support actually results in the preservation of biodiversity by the people that depend on these products.

To reinforce the sustainable use and consumption of Mata Atlântica sustainable products it was

created, in the scope of the Mata Atlântica Biosphere Reserve, the Mata Atlântica Market Program, which seeks to enroll and put into evidence sustainable products from the Mata Atlântica biodiversity and to increase the income of the ventures based thereon. This program is becoming a reference of the PNPSB to the value chains of the Mata Atlântica and helps identifying ventures that may benefit from opportunities of communication and trade through the insertion of the Social-Biodiversity Stand in national and international events and fairs.

In its strategic planning, the Mata Atlântica Market Program relates its goals to the "Aichi Goals and Targets", especially Goal A – Target 1 – raise the awareness of people on the value of biodiversity, Target 2 - integrate biodiversity values into the development, and Target 4 – Sustainable production and consumption; Goal C – Target 13 – Preservation of agricultural biodiversity; and Goal E – Target 18 – Respect to traditional population and knowledge. In 2011, the Program already served more than 3000 ventures and in 2012 the first 20 products were certified with the Mata Atlântica Market Seal.

It is worth mentioning some activities focused on the sustainable use of the natural resources and generation of income in some states covered by the Mata Atlântica, such as Ceará with the sustainable culture and processing of seaweeds in the municipalities of Icapuí and Trari, made by the Fundação Brasil Cidadão/ Terramar; the implementation of agricultural/forest systems and agreements for the production of honey, tropical flowers, and forest coffee, made by the State Secretariat of Agricultural Development/CEPEMA, CONCAFÉ Cooperative and APEMB Association.

Standing out among these activities is the project for the generation of income supported by the RBMA Advanced Stations in Alagoas, which allowed for the development of 55 projects, benefitting 5,534 families vinculadas in associations and cooperatives and securing a minimum income of R\$ 500.00 (five hundred reais) per family.

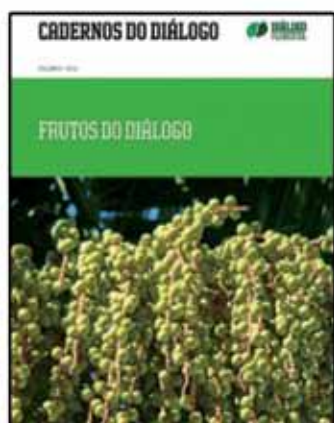
ACCESS TO INFORMATION HELPS RAISING AWARENESS ON THE IMPORTANCE OF PRESERVING THE BIODIVERSITY

A fundamental aspect to take information on the importance and value of biodiversity and ecosystem services junto as to the authorities and the society in general is the production of material de divulgação in an accessible language. In this sense, many publications were released to help people understanding the importance of preserving the biodiversity, in addition to showing manners and methods for the environmental recovery of the Mata Atlântica. Among these, the Ministry of the Environment published: a) Mata Atlântica - Patrimônio Nacional dos Brasileiros, 408p, 2010 (The Mata Atlântica – National Heritage of the Brazilian People, 408p, 2010); b) Mata Atlântica - Manual de Adequação Ambiental, 91p, 2010 (Mata Atlântica – A Handbook for the Environment Adequacy 91p, 2011); c) Pagamentos por Serviços Ambientais na Mata Atlântica: lições aprendidas e desafios, 272p, 2011 (Compensation for Environment Services in the Mata Atlântica: lessons learnt and challenges, 272p, 2011).

Among several publications made by the governments of the states covered by the Mata Atlântica e devidamente referenciados na bibliografia, podemos destacar: Livro Biota Minas – Diagnóstico da Conhecimento sobre a biodiversidade no Estado de Minas Gerais (1st Minas Biota Book – A Diagnosis on the Knowledge on the Biodiversity of the state of Minas Gerais); Checklist Flora de Alagoas (Checklist of the state of Alagoas Flora); Inventário dos remanescentes florestais de Alagoas (Inventory of the forest remainings of the state of Alagoas); Áreas e Ações Prioritárias para a Conservação da Biodiversidade da Mata Atlântica no Estado do Espírito Santo (Areas and Priority Actions for the Conservation of the Mata Atlântica Biodiversity in the state of Espírito Santo); 5o Últimos Refúgios: Parque Estadual de Itaúnas, ES. (5th Last Refuges: State Park of Itaúnas, Espírito Santo)

Also several NGOs, academic institutions, institutional networks and companies have contributed with important recent publications and promotional material on the Mata Atlântica. For example we can mention the series of books

RBMA since 1994 dealing with various issues of conservation, knowledge and sustainable development in the biome, the publications of the Pact for the Mata Atlântica Restoration and Forest Dialogue. Place figures with RBMA publications of the Covenant and the Forest Dialogue



CONCLUSIONS AND RECOMMENDATIONS

It is certain that over the last decades in Brazil, and in particular the Mata Atlântica, there has been significant progress in increasing and consolidating the knowledge of biodiversity and also in implementing actions for its protection, preservation, and recovery, thanks to the action of several universities, research centers, government bodies, the Attorney General's Office, companies, media, NGOs, and social movements. This progress is also reflected in the results of the national public opinion polls mentioned.

The learning and research institutions, companies, churches, popular movements, social organizations, media, the Attorney General's Office, the Judiciary, and environmental NGOs play a fundamental role both in demanding coherence and proactive actions by the governments and spreading the knowledge of biodiversity to the general public.

The growth of the Internet and social networks points to a crucial role of media in coming years. An example of the strength of these new communication tools was the campaign "VetaTudoDilma" asking the president's veto of the Forestry Code approved by Congress, which became a phenomenon in networks sociais. Though the presidency has made only partial vetoes and complemented by controversial provisory measures, according to several analysts it consolidates Brazilian environmental setbacks in the area, the subject won national repercussion in the political agenda and will certainly be important in the forthcoming elections as a large pointed of a gap between what society thinks and what the politicians decide. What is indisputable is the fact that with the advent of social networking account with new tools for information, conscientization and mobilization of society in favor of a more sustainable development.

It is critical to show the importance of biodiversity and spread information on what to do, how to do, when and where each citizen can act to provide its share of contribution in the defense, preservation, or restoration of biodiversity and natural resources.

STRATEGIC GOAL B: REDUCE THE DIRECT PRESSURES ON BIODIVERSITY AND PROMOTE SUSTAINABLE USE

- **Target 5** - By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.
- **Target 6** - By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.
- **Target 7** - By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.
- **Target 8** - By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.
- **Target 9** - By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.
- **Target 10** - By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.



This goal addresses the pressure on biodiversity and at the same time the promotion of sustainable use. This item will deal with matters related to the mapping and monitoring of the evolution of the Mata Atlântica's native vegetation, the main current vectors of its destruction and its interaction with the coastal and marine area.

MAPPING AND MONITORING

The Mata Atlântica is the most altered Brazilian ecoregion due to the drastic decrease of its original area. An assessment including all types of vegetation as well as the remaining (initial, medium, and advance stages of regeneration and primary vegetation) held in 2008 by the IBAMA's Remote Sensing Center has indicated 26.5% of remaining native vegetation, of which 21.6% are forest and 4.9% non-forest physiognomies, including some areas of forest contact (CSR/IBAMA 2010). Another assessment, made by the Fundação SOS Mata Atlântica and the INPE, indicates the existence of mere 7.91% of the original area in well-preserved remains with a size larger than 100 hectares (one square kilometer)¹, distributed across 18,397 polygons (Figure 6).

These data indicate that the fragmentation of the Mata Atlântica's native vegetation is an extremely critical process, in its several ecosystems, with predominantly disperse fragments, not rarely distant from each other, jeopardizing genetic flow and, therefore, the maintenance of its biological diversity. Part of the remains is found in private properties located in mountain regions of difficult access for agricultural use, especially in the country's south and southeast regions. This difficult access affected the development of agricultural activities and contributed to the preservation of these areas.

The monitoring of the native vegetation of the Mata Atlântica, made systematically since 1985 by Fundação SOS Mata Atlântica jointly with the INPE, indicates a decrease in deforestation for all periods analyzed

¹ Atlas of the Mata Atlântica Remains, 2005-2008: <http://www.sosmatatlantica.org.br/index.php?section=content&action=contentDetails&idContent=392> - "This number comprises fragments larger than 100 hectares, or 1 km², and are based on forest remains of 16 out of 17 States where they occur (AL, PE, SE, RN, CE, PB, BA, GO, MS, MG, ES, RJ, SP, PR, SC, and RS), amounting to 128,898,971 hectares".

as compared to the previous periods (Table 3). However, the zero deforestation defined by the CONABIO for 2010 has not been achieved yet.

According to the most recent data of SOS Mata Atlântica/INPE², in the 2008-2010 period, the annual deforestation rate presented, on average, a 21% drop in relation to the study's previous period (2005 – 2008). This assessment, which included areas of 9

2 ATLAS OF THE MATA ATLÂNTICA REMAINS 2008-2010 PERIOD
http://mapas.sosma.org.br/site_media/download/atlas_2008-10_relatorio%20final_versao2_julho2011.pdf

The SOS/INPE mapping does not include forest remains in initial stage of regeneration and the remains of some ecosystems associated to the Mata Atlântica such as altitude fields and vegetation refuges.

Period	Deforestation - hectares
1985-1990	466.937
1990-1995	500.317
1995-2000	445.952
2000-2005	174.828
2005-2008	102.938
2008-2010	31.195
2010-2011	13.312
Total	1.735.479

Table 3. Evolução do desmatamento da Mata Atlântica
 FONTE: SOS Mata Atlântica/INPE (Atlas dos Remanescentes Florestais da Mata Atlântica, 2010-2011: http://webcall.riweb.com.br/sos/29052012/material/290512_atlas2010-2011_sintese.pdf)

states (Goias, Minas Gerais, Espirito Santo, Sao Paulo, Mato Grosso do Sul, Paraná, Santa Catarina, and Rio Grande do Sul) pointed out the deforestation of 31,195 thousand hectares of forest remains, sandbanks, and swamp vegetation, and showed that some states continue to deforest more than others.

In some states there was a significant reduction in deforestation, while in others the increase was very high. The most serious cases identified were in the states of Minas Gerais, Paraná, and Santa Catarina. The State of Minas Gerais was the champion deforester in the period, having lost an area equivalent to 12.5 thousand football fields – an increase of 15% in relation to the date from 2005 to 2008. Still in Minas Gerais, the municipality of Porto dos Volantes, in the Jequitinhonha Valley, recorded 3.2 thousand hectares of deforestation alone, more than double the devastation of the Rio de Janeiro, São Paulo, Mato Grosso do Sul, Espírito Santo, and Goiás states together in the same period. In the period 2010-2011, SOS Mata Atlântica and INPE deforestation show a total of 13,212 hectares, indicating further drop in deforestation. In total there was a 18% drop compared to the 2010 survey, when deforestation reached 31,195 hectares. É entretanto alarming fact that only two states, Minas Gerais (with 6,339 hectares) and Bahia (with 4686 hectares), respond together for 83% of all Mata Atlântica deforestation in the period (Table 4).

UF	Área UF	Biome's Original Area	% UF	Forest Remnants		Decrement (period 2010-2011))
				2010	2011	
1º	MG	58.697.565	27.235.854	46%	3.087.045	6.339
2º	BA*	56.557.948	18.875.099	33%	2.408.648	4.493
3º	MS	36.193.583	6.366.586	18%	969.684	588
4º	SC	9.591.012	9.591.012	100%	2.322.891	568
5º	ES	4.614.841	4.614.841	100%	512.590	364
6º	SP	24.873.203	16.918.918	68%	2.642.468	216
7º	RS	28.403.078	13.759.380	48%	1.132.084	111
8º	PR	20.044.406	19.667.485	98%	2.429.652	71
9º	RJ	4.394.507	4.394.507	100%	861.086	92
10º	GO	34.127.082	1.051.422	3%	33.617	33

* State partially evaluated

Tabela 4. Deforestation in the period of 2010-2011 (in ha)
 FONTE: SOS Mata Atlântica/INPE (Atlas dos Remanescentes Florestais da Mata Atlântica, 2010-2011: http://webcall.riweb.com.br/sos/29052012/material/290512_atlas2010-2011_sintese.pdf)

Remanescentes de Vegetação Nativa da Mata Atlântica

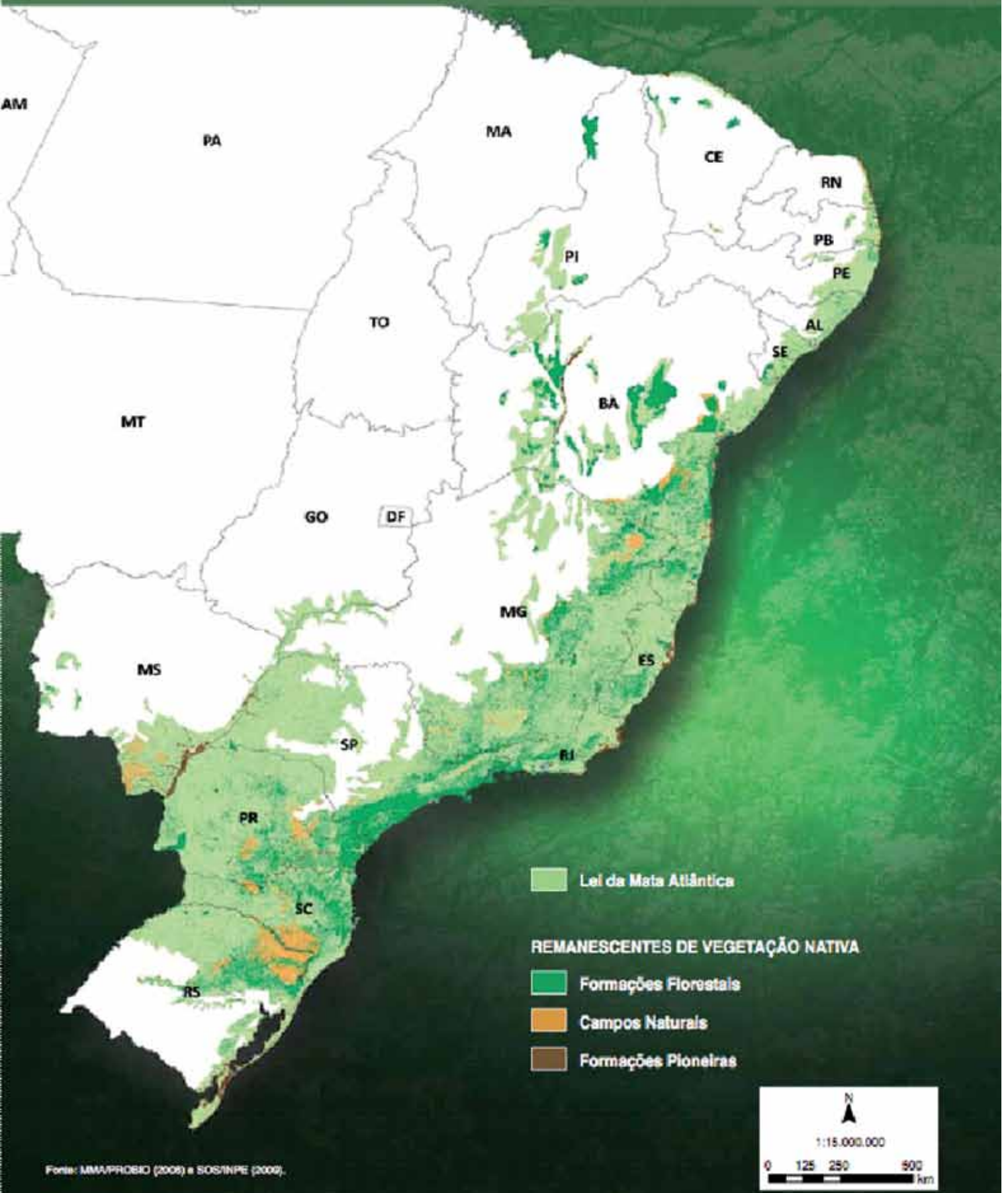


Figure 6: Map of the remains of native vegetation in the Mata Atlântica

The constant drop in the deforestation pace is the result of a specific and more strict legislation to the Mata Atlântica (Decree 750/93 and currently the Mata Atlântica Law – Law 11.428/06 and Decree 6.660/08), and a firmer action by inspection bodies and the Attorney General's Office, besides countless environmental education campaigns made by NGOs and public bodies.

VECTORS OF DEFORESTATION

According to the Ministry of the Environment³, even with the general deforestation pace consistently slowing down, deforestation numbers are still alarming and totally unjustifiable when considering the degree of destruction reached in the Mata Atlântica. There are many factors still impacting and contributing to the Mata Atlântica's degradation. One of them is the progress of cities without any planning and at the mercy of real estate speculation, particularly in coastal cities. The result of this is the destruction of ecosystems and social-environmental disasters with whole lots being hit by landslides on steep slopes or suffering with floods due to having installed in permanent preservation areas on the banks of rivers.

There are also large works and developments such as hydroelectric plants, which are still planned without the due consideration the importance of preserved natural ecosystems. A recent example is the Barra Grande hydroelectric plant on the Uruguai River basin, at the border of Santa Catarina and Rio Grande do Sul, which flooded more than 6,000 hectares of Mata Atlântica, of which about 3,000 hectares were primary forest. Another example, which can still be avoided, is the set of hydroelectric plants designed for the Ribeira de Iguape River basin, at the border of São Paulo and Paraná.

Another impacting activity, especially in the northeastern states of Ceará, Rio Grande do Norte, and Paraíba, is the captive shrimp culture, many times installed in sandbanks and swamp areas, suppressing the natural ecosystem and limiting the activity of the traditional population, who live off crab catching.

There are also threats from mining activities, in particular in the south region of Santa Catarina and parts of Minas Gerais and Espírito Santo, which cause negative environmental impacts and usually suppress forest remains and ecosystems associated to the Mata Atlântica. The progress of extensive agricultural and exotic tree monocultures is still made without the due environmental care and planning in some regions, especially in Bahia, Espírito Santo, and Minas Gerais causing deforestation. In the Santa Catarina, Paraná, and Bahia states there is still selective exploration of endangered species of woods, even though this activity is illegal. In Bahia, the handicraft industry uses endangered species of woods as raw material.

Another important vector of destruction is the deforestation or depletion of native vegetation for the production of vegetal coal, used in the steel industry. This illegal activity has been suppressing remains of decidual and semidecidual seasonal forests, especially in the interior of Minas Gerais, Bahia, and Piauí. Many times this activity has the complacency of Federal and State environment bodies.

At last, it is worth mentioning that the Mata Atlântica is still not free from the capture and trafficking of its wild animals and indiscriminate hunting in some regions, problems that are hard to control.

THE MATA ATLÂNTICA AND THE MITIGATION OF CLIMATE CHANGE EFFECTS

The peak of the irrational exploration and conversion of natural Mata Atlântica ecosystems for other soil uses took place in the 20th Century. A recent study published in the Global Biogeochemical Cycles magazine, conducted by Marcos Costa, of the Department of Agricultural Engineering of the Federal University of Viçosa (UFV) and Christiane Leite, also of the UFV, Britaldo Soares Filho and Letícia Hissa, of the Remote Sensing Center of the Federal University of Minas Gerais (UFMG) estimates that Brazil has emitted 17.2 billion tons of carbon (Gt-C) for this reason between 1940 and 1995, the period during which, according to them, the area

occupied by agriculture and cattle raising increased more than double, from 106 million to 219 million hectares. The most part of these emission was produced by the occupation and destruction of the Mata Atlântica (43%) and the Cerrado (29%). The Amazon appears with 25% of the total emitted in the period (Table5).

Historic carbon emissions caused by the occupation and destruction of forests in Brazil	
Biomass	%
Mata Atlântica	43%
Cerrado	29%
Amazônia	25%

Table 5. Historic carbon emissions caused by the occupation and destruction of forests in Brazil

The drop in the pace of deforestation beginning in the 1990s evidences that this tendency of carbon emission can be reverted. In addition to the drop in deforestation, in some states, during the same period a process of forest regeneration started, especially in places where the mechanization for agriculture is unfeasible, such as in the mountain regions of Serra Geral and Serra do Mar. In these places, forests have begun to reoccupy spaces. Data from the Natural Forest Vegetation Inventory of the State of São Paulo, held by the São Paulo Forests Institute, indicate that, in the period from 1991 to 2001, the Mata Atlântica area in the coast of São Paulo increased 2%, from 1,176,565.63 to 1,200,229.16 hectares⁴. A similar phenomenon has been occurring in the states of Rio Grande do Sul, Santa Catarina, Paraná, Rio de Janeiro, and Espírito Santo.

Data from the Floristic and Forest Inventory of Santa Catarina⁵ point out that the state, fully inserted in the Mata Atlântica, currently has 36.8% of forest coverage and that secondary forests in the medium and advanced succession stages of regeneration represent 90% of these remains. This information is relevant as related to an inversion in the curve

4 Forest Institute indicates increase in the Mata Atlântica area in the SP Coast http://www.cetesb.sp.gov.br/Noticentro/2006/09/25_mata.pdf

5 http://www.iff.sc.gov.br/images/stories/pdf/IIseminario/ICUia_mauricio_sintese.pdf

of carbon, since the capture of carbon is higher in the secondary regenerating vegetation due to the fastest growth of trees.

On the other hand, as related to biodiversity, data from the same Inventory indicate that the forests still shelter many species but with a low number of individuals per species, in particular those that require good environmental conditions, where about 32% of the species have less than 10 individuals found in the State. (Sevegnani & Reis, 2011).

FOREST CERTIFICATION

Forest certification should ensure that the wood used in a certain product comes from a production process handled in an ecologically adequate, socially fair, and economically feasible manner, and in compliance with all effective laws. In the Mata Atlântica, the processes for the certification of planted forests are very prominent, regulating forestry activities and therefore reducing the impact on native forest areas.

The certification is a guarantee of origin that further guides the retail or wholesale buyer to choose a different product with added value, being able to draw more demanding consumers, and therefore reach new markets. At the same time, it provides to the aware consumer the option to acquire products that do not harm the environment and contribute to the social and economic development of forest communities. For such, the certification process must ensure the maintenance of the forest, as well as the jobs and the economic activity it provides.

In Brazil, the most used standards for certification are those of the FSC (Forest Handling Council) and CERFLOR (Forest Certification). The FSC is discussing and should approve by the end of 2012 the certification standards for small-sized reforestations (SLIMF Standard), which will include thousands of small business owners in the certification network, much increasing the reach of their benefits.

THE MATA ATLÂNTICA AND THE COASTAL AND MARINE ZONE

When working with land delimitation, in this case the Mata Atlântica area as defined in the "Map of the Area of Application of Law 11.428/2006" of the IBGE, it is important to understand the interrelations between the different biomes, either in the existence of ecotones and transition zones or in the ecologic functionality between them, or also in the implication resulting from the use/occupation created in one another. According to an analysis presented in the RBMA Book No. 40 – Marine Preservation and Fishing Organization, Brazil's coastal and marine area comprehends more than 8,500km over 17 states (14 of which – 6,750km - integrate the Mata Atlântica from PI to RS) and more than four hundred municipalities distributed from the equatorial region in the north until the tempered seas of the southern country. A significant part of this vast Brazilian territory integrates the Mata Atlântica Biosphere Reserve, especially after its new consolidated delimitation in Phase VI.

The diversity of climate and oceanographic conditions results in a great variety of ecosystems and environments covering the coastal strip, the territorial sea and the exclusive economic zone. Swamps, estuaries and marshes, dune fields, sandbanks, sandy shores, rocky coasts and coastal lagoons, coral reefs, calcareous seaweed, underwater canyons and the different types of seabed, from

muddy to biodetrital, shelter countless species of flora and fauna, many of which are endemic, others shared internationally. However, a significant number of these species are in danger of extinction.

The size of the Brazilian coast and the variety of existing ecosystems and species have led to the equivocated common sense of an endless potential for resource exploration and to the adoption of development policies unrelated to the premises of sustainability, resulting, for example, in the current situation of overexploitation of about 80% of its fishing resources.

In this vast and diversified region of the Brazilian territory, many economic and social activities based on the use and appropriation of natural resources and territorial spaces coexist, mostly in a non-harmonious manner. Several developments have been announced and are being implemented along the shore, gathering offshore port structures, train and airplane terminals, logistic patios in the backside area for storage of general cargo and minerals processing and transshipment, and space delimitation for implementing steel and thermal plants.

The implementation of hotel and residential developments in areas with a tourist potential with no regard to the preservation of natural resources has implications both in the replacement of natural environments for altered landscape areas destined



to the use of visitors and vacationers and in the transformation of the social and land structure of coastal communities. Many times, these communities are removed from the coast to more interior locations, implying in difficulties of access to the sea and their original source of living, in the case of fishermen and shellfish farmers.

The culture of shrimp has been causing the suppression of swamp areas, the contamination of water by effluents and the intensification of social disputes between fishermen, shellfish farmers and businessmen. These cases have hit critical levels in the northeastern states, with serious social and environmental consequences.

In the continental shelf and oceanic area, the exploration and production of oil and natural gas has been going through a big expansion in the last decade. The oil block biddings held by the National Oil, Gas and Biofuels Agency (ANP) has been granting large areas to national and international companies in all sedimentary sea basins from Rio Grande do Sul to Amapá. Some of these areas have already turned into production fields, with the installation of oil platforms and offloading systems through gas pipelines connected to gas treatment stations and through or oil pipelines offloading ships, which send the oil production to refineries onshore or for export. Exploratory blocks, on their turn, demand countless activities of well drilling and survey of marine seismic data for prospecting oil and gas reservoirs. Upon the discovery of reservoirs located in the so-called pre-salt layer, there is a perspective of high increase in these activities in the short and medium term.

In addition to the direct impacts on the seabed and related biota as a result of the installation of oil and gas platforms and extraction and offloading systems, the impact on endangered species and fishing resources arising from surveys of seismic data and increase of naval traffic, oil exploration activities also imply in significant social impacts and conflicts. These are manifested in the marine are through the appropriation of spaces originally used for fishing activities, with higher intensity on small-scale fishing due to the limited transportation capacity and higher dependency of traditional fishermen. In the coastal zone and by consequence in the Mata Atlântica, the implications result from

the implementation of port structures and oil and gas processing and treatment plants, which suppress and transform natural environments and change the social and economic structure of coastal populations, with more intense negative effects on those traditional communities dependent on the preservation of natural environments.

A few actions are being implemented to reduce the impact on the biodiversity of coastal and marine areas. The National Plan of Protected Areas (PNAP) established areas closed fishing areas inside or outside Preservation Units as one of the components of a system representing protected areas. This fishing management instrument is usually applied by the 18 federal marine Extraction Reserves (RESEX) in strategic portions of their areas, as well as by the marine Environment Protection Areas.

Brazil has also created some protected areas with parts closed for fishing and continues to monitor and inspect the fishing production, and further increased its efforts of satellite monitoring of large fishing boats. In 2004, the Ministry of the Environment published a Normative Ruling listing endangered and overexploited species of fish and aquatic invertebrates and demanded the preparation and implementation of recovery plans. However, the reports on capture efforts show that fishing reserves are still declining. Although marine fishing contributes with 63% of the total annual fishing production in the country, at least 80% of these resources are currently overexploited or finished (REVIZEE, 2006).

Special attention was given to the coastal and marine ecosystems in the review of the delimitation and zoning of the RBMA – Phase VI, extending the marine territory in 20% (16 thousand km²) and approving the creation of the Sea Collegiate Body - COLMAR-RBMA and the Coast and Sea Program, focused on creating preservation units, mosaic of protected areas, and public policies for marine preservation and fishing organization.

Also standing out are state initiatives to protect fishing reserves, such as the three Marine APAs created by the State of São Paulo in 2008 (BRASIL/MMA, 2010) and, in Bahia, the agreement between the Ministry of Fishing, CI-Brasil and the NGO Ecomar,

which has been working in the Fishing Monitoring Program of the RESEX Corumbau, Canavieiras, and Cassurubá, in addition to the surroundings of the Abrolhos PARNAM, with the purpose to monitor the fishing production in these units.

Some studies conducted by Brazilian and foreign researchers with the support of the International Preservation (CI-Brasil) and financed by the Program "Science for the Management of Protected Marine Areas" in the region of Abrolhos, BA and ES, evidence the importance of preserving and connecting swamp areas and coral reefs, which are essential to the lifecycle of species of high commercial value. In order to promote the conservation and sustainable use of coastal and marine resources, as well as the proposition of several protected areas, lots of initiatives have gained momentum in recent years. In this regard include the formation of "Abrolhos Coalition," which brings together various NGOs and scientists, the Abrolhos Group Connection-Trinity (CAT) formed on the initiative of the RBMA and consists of governmental and nongovernmental organizations in the states of Bahia and Espírito Santo, in order to promote the conservation and sustainable use of all biota associated with the submerged mountain range between Abrolhos Archipelago Victoria and Trindade-Martim Vaz Archipelago, embodied in the proposal of the first Marine Biosphere Reserve in Brazil.

In order to promote the conservation and sustainable use of coastal and marine resources, as well as the proposition of several protected areas, several initiatives have gained momentum in recent years. In this regard include the formation of "Abrolhos Coalition," which brings together various NGOs and scientists and the Abrolhos Group Connection-Trinity (CAT) formed on the initiative of the RBMA and consists of governmental and nongovernmental organizations in the states of Bahia and Espírito Santo, in order to promote the conservation and sustainable use of all biota associated with the submerged mountain range between Abrolhos Archipelago Victoria and Trinidad-Martim Vaz, embodied in the proposal of the first Marine Biosphere Reserve in Brazil.

There are many more regional initiatives such as the Lobster Protection Program in Ceara, which aims to respect the period of closure, cultivation

and sustainable management of the Bank of Alga Mainhas - Brazil Foundation Citizen-Icapuí.

INVASIVE EXOTIC SPECIES

Invasive exotic species are currently considered the second biggest global cause of loss of biodiversity, losing only to the suppression of habitats.

Invasive exotic species are those that, through the process of biological contamination, become dominant, changing the physiognomy and function of natural ecosystem, leading native populations to the loss of space and genetic decline (BECHARA, 2003)⁶.

A diagnose of current and potential invasive exotic species made by PROBIO in 2005 based on interviews with environment, agriculture and related professionals registered 171 of these species, 63 (37%) of which are animal species and 108 (63%) are vegetal species (Brazil/MMA, 2010).

Out of the 171 invasive exotic species identified, 76% were purportedly introduced in the country (or in a biome different from its original distribution), mostly with economic purposes. Among these species are the giant African land snail (*Achatina fulica*), the wild boar (*Sus scrofa*) and the love grass (*Eragotis plana*) (PROBIO, 2005, quoted by Brazil/MMA, 2010). The import of ornamental plants and domestic animals is the main cause of the introduction of exotic species (24%). Programs for the genetic improvement of forage grass were responsible for 13% of invasive species, and those of a forest use for 9% (PROBIO, 2005, quoted by Brazil/MMA, 2010). In the marine environment, in 2008 Brazil/MMA (2008) identified 58 exotic species, namely nine (16%) considered invasive, 21 (36%) established, and 28 (48%) detected in the natural environment.

One of the forest species that presents invasion problems in some of the vegetal typologies of the Mata Atlântica, especially in sandbanks and altitude fields, is the Pinus. According to the NGO

6 ECOLOGICAL RECOVERY OF SANDBANKS CONTAMINATED WITH PINUS IN THE RIO VERMELHO FOREST PARK, FLORIANÓPOLIS, SC - <http://www.ipef.br/servicos/teses/arquivos/bechara,fc-m.pdf>



The Nature Conservancy, the *Pinus* genus is one of the main genera of invasive plants and their more problematic species are: *P. elliottii* Engelm., *P. taeda* L., *P. radiata* D. Don, *P. pinea* L., *P. patula* Schl. & Cham., *P. rigida* Mill., and *P. thunbergii* Parl. (TNC, 2001).

The damages caused to biodiversity and landscaped with the invasion of *Pinus* are particularly serious when they affect the preservation units located in native field areas or sandbanks.

There are still few concrete actions for the control and eradication of invasive exotic species. An example is the "Paraná State Program for Invasive Exotic Species", comprised of four components: Coordination and Integration; Prevention, Eradication, Control and Monitoring; Technical Training and Public Information, and Legal Basis and Public Policies. It is managed by a Committee comprised of 8 members of state and federal bodies and NGOs, under the coordination of the Paraná Environment Institute (IAP). Paraná also published, in 2007, and reviewed in 2009, the "List of Invasive Exotic Species of Paraná". Besides, the state enacted rules with policies for the prevention and control of IES in the State of PR (Rulings 192/05 and 125/09).

In the Northeast Region, the AMANE (Protection of the Northeast Mata Atlântica Association) diagnosed invasive exotic species of the Murici-Alagoas Ecological Station, Dois Irmãos State Park, and Caetés – Pernambuco Ecological Station, seeking to eradicate, control and prevent the invasion of exotic species.

Other states have made assessments and researches of invasive exotic species, such as Bahia, which in 2011 prepared the technical report on invasive exotic species in the Mata Atlântica's Central Corridor that evaluated problems related to invasive exotic species in the Descobrimento National Park, Pau Brasil National Park, Alto Cariri National Park, Uma Biological Reserve, Nova Angélica Private Reserve – Una, and Serra do Conduru State Park.

It was held at the Federal University of Bahia research on benthic introduced in Brazil, besides performing the compilation of records of exotic benthic organisms in the country, studied their current origin and distribution, which assessed presence of exotic species in 24 Brazilian states,

especially where major ports are located.

In the case of Rio de Janeiro, for instance, that is a state totally covered by the Mata Atlântica 432 exotic species and 109 of them are considered invasive were registered, allowing for the progress in the preparation of a draft regulation for the control of these species

CONCLUSIONS AND RECOMMENDATIONS

The data on the systematic reduction of the deforestation rates in the last 20 years indicate that some public policies adopted in Brazil during the last decades have done the right thing. However, there are still many vectors of deforestation that must be controlled. The data of the drop in deforestation show a direct relation with the improvement of the legislation regulating the use and preservation of the Mata Atlântica, resulting in the approval of the Mata Atlântica Law (Law No. 11.428/06), which protected all remains of primary vegetation and secondary vegetation in the initial, medium, and advanced stages of regeneration. The legislation,



in addition to effectively contributing to the reduction of deforestation rates, is giving a chance for the fragments of remaining native vegetation to recover their structure and biodiversity due to the prohibition of general forest suppression and exploitation.

In addition to the effective implementation of the laws regulating the preservation and use of the Mata Atlântica to reduce the rate of loss of all native habitats, including forests and other forms of native vegetation, it is also fundamental that Brazil immediately observes then 2020 Aichi Targets (CDB) for the creation of protected areas, increasing their number in a significant an representative



manner in all terrestrial ecosystems and the coastal and marine zone, as well as it is important that the Country prepare the zonings and define the suitability of areas according to the fragilities of the ecosystems and the relevance of the environmental services provided, so as to strengthen sustainable uses and minimize the losses of biological and social diversity.

In supplement to the legislation and the environmental education programmes, some voluntary initiatives such as forest certification help raising awareness regarding the sustainable production and consumption among the society. These initiatives are important and must be supported and stimulated in other industries of the economy.

The discussion of damages caused to biodiversity by invasive exotic species is relatively new in Brazil. Likewise, there are still few concrete actions for the control and eradication of these species, which must become a priority for the managers of preservation units. Besides, this issue must be addressed inter-institutionally, involving governments, research institutes, private initiative, and NGOs, and must be among national, state, and municipal environment plans.

The progress already achieved point to a perspective of significant changes in the consumption habits and standards of use of natural resources. Therefore, it is essential to include in the agendas and public policies the protection of forests, reduction of deforestations, control of invasive exotic species, creation and implementation of land and marine preservation units, development of new technologies that decrease the emission of pollutants and the adoption of alternative and clean sources of energy.

**STRATEGIC GOAL C: TO IMPROVE THE STATUS OF BIODIVERSITY
BY SAFEGUARDING ECOSYSTEMS, SPECIES AND GENETIC
DIVERSITY**

• **Target 11** - By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.

• **Target 12** - By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.

• **Target 13** - By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and



In this goal we will address the importance and need of a national legislation to give effect to the targets assumed internationally. Another issue to be dealt with in this item is the richness of the biodiversity of fauna and flora and the endangered species, as well as the status of protected areas and endangered species, two completely connected issues, since protecting these areas is the most effective strategy to ensure the protection of species of flora and fauna and their genetic variability in the long term.

The CBD goals and targets are important landmarks but their effectiveness always depends on internal country regulations to be achieved. In the case of the Mata Atlântica, the CBD targets already have the support of a set of legal rules that can ensure the effective compliance. The 1988 Federal Constitution consolidated a few principles already advanced by the 1965 Forest Code, setting forth in its Article 225 that everyone has the fundamental right to an ecologically balanced environment, and the State and society in a cooperation regime shall preserve it to the present and future generations, which shall be done as follows: a) preservation and restoration of the essential ecological processes and promotion of the ecological handling of ecosystems; b) preservation of the diversity and integrity of the genetic heritage; c) creation of territorial spaces and their components to be specially protected in all Federative units; e) promotion of environmental education in all levels of learning and also through raising of public awareness to preserving the environment; e) protection of the fauna and flora, prohibiting practices that jeopardize their ecological function, cause the extinction of species or subject animals to cruelty.

Specially protected territorial spaces included the Preservation Units established in Law 9.985/2000, which instituted the National System of Conservation Units (SNUC), in addition to other categories of protected areas, such as Legal Reserves and Permanent Preservation Areas (Law 4.771/1965), Indigenous Lands, Quilombos and, in the case of the Mata Atlântica, all remains of native vegetation protected by Law 11.428/2006. This group of areas, if well implemented, may ensure the compliance with the CBD rules and, therefore, the protection of biodiversity and genetic flow, ecosystem services and the mitigation of climate changes, besides providing quality of life and welfare to the population.

BRAZILIAN LAWS SUPPORT THE GOALS AND TARGETS OF THE CBD IN THE MATA ATLÂNTICA

One of the first environmental protection rules in Brazil was enacted through Federal Decree 23.793/1934, which instituted the Brazilian Forest Code, prepared with the collaboration of several naturalists, who at the time were already concerned with the preservation of the basic functions of natural ecosystems and aware of the importance of preserving all types of native vegetation instead of only those that could provide firewood to the industry.

One of the greatest innovations of the 1934 Forest Code¹ was the creation of an exclusive regime for forests and other native vegetations in the country, which were elevated to the condition of “assets of common interest to all citizens”, conditioning the exercise of the right to property to its rational use. The 1934 Forest Code constituted the Federal Forest Council, a body that played a relevant role in the creation of many national parks. In the same year of 1934, the Constitution encharged the State of protecting “natural beauties and monuments of historic or artistic value” (article 10), thus providing the legal basis for organizing preservation units in Brazil (Urban 1998 and Araújo 2007). In the five following years, the first national Brazilian parks were created: Itatiaia, in 1937, and Iguaçu and Serra dos Órgãos, in 1939, all protecting Mata Atlântica ecosystems.

From 1945 to 1964, a list of important protected federal areas was created, most of which located in the Mata Atlântica, including reserves destined to the preservation of endangered species, such as the first wildlife refuge in Sooretama, in Espírito Santo (Drummond 1997). They are: the Araripe-Apodi National Forest and the Paulo Afonso National Park, both in the Northeast Region; and the national parks of Aparados da Serra (Rio Grande do Sul and Santa Catarina), Ubajara (Ceará), Caparaó (Minas Gerais and Espírito Santo), Sete Cidades (Piauí)², São Joaquim (Santa Catarina), Tijuca (Rio de Janeiro), Sete Quedas (Paraná), and Monte Pascoal (Bahia) (Araújo 2007).

1 Forest Code History - <http://www.sosflorestas.com.br/historico.php>

2 The Araripe-Apodi National Forest and the Sete Cidades National Park (PI) are the only outside the Mata Atlântica.

Even in the 1950s there were also the first state parks, especially in São Paulo State, as the State Park Turístico do Alto Ribeira (PETAT) (Touristic State Park from Alt Ribeira (PETAR) and State Park Carlos Botelho preserving important areas of tropical forest and several endangered species .

In 1962, a work group was organized under the scopes of the Ministry of Agriculture to prepare the proposal of a “new” Forest Code, which was finally approved in 1965, through Federal Law 4.771, effective to date. The so-called “New Forest Code” kept the assumptions and goals of the 1934 Code and established the creation of national parks and forests as manner to handle forest physiognomies and instituted permanent preservation areas, including spaces located on the margins of bodies of water, hilltops, and steep slopes, among others. The suppression of vegetation in these areas is forbidden, except in cases of public utility, social interest, or for any low-impact activities. Besides permanent preservation areas, the legal reserve related to a percentage of the rural properties that must maintain native vegetation was set forth. In the Mata Atlântica, this index is 20%. The Fauna Protection Law (Lei 5.197/1967) banned hunting in the country and established the creation of biological reserves, setting an important precedent for the protection of wildlife.

The political impact of the Stockholm Summit in 1972 led the Brazilian government to create the Special Environment Secretariat (Sema), which in joint activity with the Brazilian Forest Development Institute (IBDF) set new categories of protected areas: ecological stations, ecological reserves, environmental protection areas, and areas of relevant ecological interest. Between 1969 and 1974, another lot of parks and reserves was decreed, three of which located in the Mata Atlântica: the Serra da Bocaina (RJ) and Serra da Canastra (MG) National Parks and the Poço das Antas (RJ) Biological Reserve (Araújo 2007). In parallel, states such as São Paulo, Rio de Janeiro, Santa Catarina, and Rio Grande do Sul decreed important state preservation units along the 1970 and 1980 decades. Among them the State Park of Serra do Mar in São Paulo State, the biggest conservation unity in Brazil with more 310,000 ha.

Law 6.938/1981 set forth the National Environment Policy, its goals and instruments, and organized the National Environment System (Sisnama), under the scope of the Government Council and with the National Environment Council (CONAMA) as its advisory and deliberative body. The executive bodies are the Ministry of the Environment and its institutions bound on a federal level and the environmental bodies and entities of the States, the Federal District, Territories, and Municipalities, as well as the environmental foundations instituted by the Public Authority, in charge of protecting and improving the quality of the environment.

The 1988 Federal Constitution considered the Brazilian Amazon, the Mata Atlântica, the Serra do Mar, the Pantanal of Mato-Grosso and the Coastal Zone as a national heritage, and determined that their utilization observes conditions that ensure the preservation of the environment, including as to the use of their natural resources.

The United Nations Conference on Environment and Development, held in Rio de Janeiro in 1992, resulted in a broad process of building a consensus around global commitments to the preservation of natural resources, triggered national processes of preparing policies of protection and use of biodiversity. The adhesion of the Brazilian government to the Convention on Biological Diversity (CBD), during the Rio-92, caused the creation of the National Biological Diversity Program (PRONABIO), under which many projects aiming at the preservation, sustainable use, and sharing of benefits arising from

the biodiversity³ were executed.

In 1998, Law of Environmental Crimes (Law 9.605), dealing with penalties applicable to behaviors that damage the environment, was enacted. In the year 2000, Law 9.985 was enacted and the National System of Nature Conservation Units (SNUC) was created, and in 2006, after 14 years of negotiation, it was the Mata Atlântica Law (Law 11.428), providing on the use and protection of the different forest formations and related ecosystems⁴.

The first specific legal rule concerning the Mata Atlântica was Decree 99.547/90, which forbid any and all suppression of native vegetation in this area, superseded in 1993 by Decree 750. This Decree legally defined the Mata Atlântica domain, including several different forest formations and related ecosystems, and established the protection of the remains of native primary vegetation, as well as the regeneration secondary vegetation.

Federal Law 11.428, known as the Mata Atlântica Law, approved after 14 years of negotiation in the National Congress and enacted on December 22, 2006, has the main purpose to preserve the remains of native vegetation of the Mata Atlântica in the country and to create means for the forest and related ecosystems to regenerate where they are practically extinct nowadays.

Decree 6.660, dated November 21, 2008, regulated Law 11.428/06, and therefore consolidated the legislation of protection of the Mata Atlântica when establishing “what”, “how”, and “where” there can be intervention or sustainable use in the remains of native vegetation. Decree 6.660/08 also detailed the native forest formations and related ecosystems that integrate the Mata Atlântica. All typologies of vegetation protected by the Mata Atlântica Law are



3 The National Biological Diversity Program (PRONABIO) was created in 1994 under the scope of the Ministry of Environment and obtained resources of the Global Environment Fund (GEF), managed by the World Bank, destined to the execution of the Project for the Preservation and Sustainable Use of the Brazilian Biological Diversity (PROBIO). The PROBIO seeks to implement the commitments contained in the CBD, among which are the establishment of protected areas to promote the in situ preservation of the biological resources existing in the national territory.

4 The provisions of Law 11.428/06 were regulated by Decree 6.660/08 and the Mata Atlântica area was delimited by the Map of the Area of Application of Law 11.428/06 of the IBGE

delimited in the “Map of the Area of Application of Law 11.428/2006” of the IBGE. The framework of protective rules of the Mata Atlântica is backed by a set of resolutions of the National Environment System (CONAMA) that define the primary and secondary vegetation and establish the technical parameters for their identification.

The Mata Atlântica Law increased the protection beyond the strict limits of the permanent protection and legal reserve areas set forth by the Forest Code, binding this protection to the remains of native vegetation, with variable degrees due to the stage in which the vegetation is found. This Law governs the preservation, protection, regeneration, and use not only of the remains of primary native vegetation, but also in the initial, medium, and advanced secondary stages of regeneration.

As previously mentioned, in recent years in Brazil there was a clear change of direction in development policy giving priority to economic growth rather than a vision of sustainability that reflects so far in the Brazilian legislation, whose advances have put the country as the world leader in the socioambiental field. This change can be noted especially with the weakening of federal environmental bodies and clear setback of environmental legislation. An emblematic case of this process was the Forest Code changed and defigured in Congress

The resulting Law 12,651/12 and Provisional Measure 571/12 that changed the Forest Code, in general, kept the previous parameters of Areas of Permanent Preservation and Legal Reserves only to still preserved areas, innovate for worse. In relation of the already occupied consolidate areas grant amnesty to recover legal reserve for properties with up to 04 fiscal modules that have deforested before June 2008 and similarly, amnesty up to 80% recovery of permanent preservation areas deforested by June 22, 2008. These changes in the Forest Code are particularly harmful for the Mata Atlântica because as shown by the leading scientific institutions of the country they are putting at risk the possibility of recovery and the interconnection of thousands of fragments, increasing the edge effect, affecting biodiversity, gene flow species and increasing the risk of extinction. It also affects the quality of life increasing risks of erosion, flooding, landslides, reducing the supply of essential ecosystem services such as the protection of water and climate.

THE BIODIVERSITY OF THE MATA ATLÂNTICA

Despite the intense destruction and the reduced area of remains of native vegetation, it is estimated that the Mata Atlântica still houses 20 thousand vegetal species, which represents about 40% of the species identified in the country and a number higher than the total found in Europe (12,500 species) and North America (17,000 species). Studies made in Serra do Conduru, in the south of Bahia, during the 1990s, indicate the existence of 454 species of trees per hectare (New York Botanical Garden and CEPLAC), a number higher than the record registered in the Peruvian Amazon in 1986, of 300 species per hectare – a datum that elevates the Mata Atlântica to the condition of the region holding the biggest diversity of trees per area unit in the whole world (Lino C.F et al. 2008)

However, this huge richness of species is still endangered and in risk of extinction. The Official List of Endangered Species of the Brazilian Flora (MMA, 2008)⁵ names 472 species, a number four times higher than the previous list of 1992. Out of the 472 species of the flora in the Official List, 276 species (more than 50%) are natural of the Mata Atlântica, including those that were the most economically exploited over time, such as the pau-brasil (*Caesalpinia echinata*), juçara palm (*Euterpe edulis*), Brazilian pine (*Aracuaria angustifolia*), jequitibá (*Cariniana ianeirensis*), jaborandi (*Pilocarpus jaborandi*), xaxim (*Dicksonia sellowiana*), rosewood (*Machaerium obovatum*), Bahia rosewood (*Dalbergia nigra*), white rosewood (*Swartzia pickelii*), black cinnamon (*Ocotea catharinensis*), Brazilian sassafras (*Ocotea odorifera*), imbuia (*Ocotea porosa*), and several orchids and bromeliads. The Official List also presents 1,079 species with insufficient data, the majority of which belong to the Mata Atlântica and were equally subject to intense and unbearable economic exploitation over the years.

In relation to the fauna, the available assessment indicate that the different vegetal phytophysionomies of the Mata Atlântica shelter 849 species of birds, 370 species of amphibians, 200 species of reptiles, 270 species of mammals and 350 species of fish. Many components of this fauna diversity are in danger of extinction. This is

the case of 185 vertebrates, comprising 118 species of birds, 16 of amphibians, 38 of mammals, and 13 of reptiles. It is also estimate that 59 species of fish are endangered in the hydrographic basins of the eastern Brazil, between the São Francisco River mouth and the north of Santa Catarina.

Some states have a list of the endangered species of the fauna and flora, such as Minas Gerais, which in 2010 revised the list of the endangered species of the fauna published in Copam Normative Resolution No. 147 and the list of the endangered species of the flora published through DN 367/2008 and revoked by DV 424/2009.

The Mata Atlântica also stands out due to its diversity of endemic species – that is, species that develop only in one area in the entire planet. This is the case of the 73 species of mammals, among which are 21 species and sub-species of apes – including to genera of endangered apes, the golden lion tamarin and the woolly spider monkey (Rylands, A.B., Fonseca, G.A.B., Leite, Y.L.R. & Mittermeier, R.A., 1996). The situation of these endemisms is particularly critical, since these are unique species that inhabit restricted areas in this region only. Species characteristic of singular environments in the coastal and marine zone, such as coral reefs, swamps, and sandbanks, are seriously endangered in view of the depredations of urban and industrial activities (MMA 2010).

Thus, the Mata Atlântica is currently in the list of the 25 acknowledged biodiversity hotspots in the world – regions that lost at least 70% of its original vegetation, but together house 60% of all terrestrial species in the planet (Galindo-Leal & Câmara 2005).

PRESERVATION UNITS IN THE MATA ATLÂNTICA

The loss of habitat is the most important cause that leads species to the condition of endangered. The current situation of habitat reduction and fragmentation of the Mata Atlântica makes this scenario very serious. This stresses out the importance of Brazil's investments in the significant increase in number and extension of protected

areas in all biomes⁶. Despite the existence of an adequate legislation framework, sadly we are still far from achieving the goal of 17% of effectively protected areas in conservation units (CUs) in the Mata Atlântica approved by the Convention on Biological Diversity – CBD.

Estimates made by the Ministry of the Environment (MMA) and partners⁷ show that 10,029,712 hectares (7.6%) of the original Mata Atlântica area are inserted in conservation units, including those of sustainable use (Table 6). The worrying statistic is that a mere 2.6% of the original Mata Atlântica area (3,486,343 ha) are inserted in categories of conservation units of the integral protection group. The sustainable use of CUs amount to 6,543,369, of which 6,380,172 are located in Environmental Protection Areas (APAs), a category less restrictive to direct use. The low degree of restriction to the use in APAs can be easily observed since only 41.6% of the total area of the APAs is still covered with native vegetation in the several stages of regeneration, and the remainders are areas converted for agriculture, cattle raising, forestry or other ends. These estimates were made considering federal, state and municipal preservation units dully enrolled in the National Roll of Conservation Units (CNCU) up to April 4, 2012.

According to these estimates, there are about 24 million hectares of Mata Atlântica remains located outside conservation units, a number much higher than the total protected in CUs, which is about 5.8 million hectares. Considering that there are still ongoing activities that deforest or deplete this vegetation, with due regard to the protection conferred by other categories of protected areas such as indigenous lands, permanent preservation areas and legal reserves, the federal, state, and municipal government should immediately create new conservation units, especially for integral protection, such as parks, which have been proving an effective way to protect these rare remains (91% of the area of the Mata Atlântica parks are covered with remains of native vegetation) and can still

6 Fourth national report for the convention on biological diversity: Brazil / Ministry of the Environment. Brasília: MMA, 2011.

7 All analyses were made based on the Mata Atlântica area delimited by the Map of the Area of Application of Law 11.428/06, in the scale of 1:1.000.000, according to the vegetation maps of Projeto RADAM Brasil (scales 1:1.000.000 and 1:250.000).

be publicly used, thus developing the regional economy with ecotourism.

Although it is clear that it is extremely important and urgent to create new conservation units, the current scenario points towards the opposite path, both in the federal level as in most states and municipalities. In 2011, no new federal preservation unit was created, and for the first time the Executive sent to the National Congress Provisional Measure No. 558, which excluded 86 thousand hectares from seven federal Conservation Units in the Amazon to house building sites and reservoirs of four great barriers in the Madeira and Tapajós rivers. Besides the fact that no technical studies and public debates had been previously held concerning the Tapajós hydroelectric plants, the Federal Constitution sets forth that protected areas could only be altered and suppressed by law, which led the Public Attorney's Office to file the Direct Action of Unconstitutionality (ADI) with the Federal Supreme Court against the use of a Provisional Measure by the President.

Large infrastructure works have also contributed significantly to the extinction of species. Many times this extinction occurs due to lack of information, but not always. In the case of the Mata Atlântica one can mention the *Dyckia distachya* bromeliad, extinct from nature by the lake of the Barra Grande hydroelectric plant (built on the Pelotas River, in the border of SC and RS) even though all studies indicated that this would happen, i.e. it was an "authorized" extinction.

However some positive initiatives concerning infrastructure may be noted in some States that are engaged in the creation of new conservation units. In Minas Gerais, for example, in the years 2010/2011, 15 State Conservation Units were created in Minas Gerais, increasing the protection of the Mata Atlântica, Cerrado, and Dry Forest, among other Brazilian biomes. Still in 2010/2011, 27 RPPNs were instituted, amounting to 353,662.13 ha of protected areas in conservation units of sustainable use and integral protection. The National Heritage Private Reserves reflect the articulation of the

Number and area of conservation units in the Mata Atlântica per category			
Category	Number of CUs	Area in the Mata Atlântica (hectares)	% on total area of CUs
Integral protection			
Ecological Station	38	265.127	2,6
Natural Monument	13	35.917	0,4
National Park (State and Municipal)	155	2.887.048	28,8
Biological Reserve	25	221.675	2,2
Wildlife Refuge	23	76.576	0,8
Subtotal	254	3.486.343	35,0
Sustainable use			
Environmental Protection Area	155	6.380.172	63,6
Area of Relevant Ecological Interest	17	22.271	0,2
National Forest (State)	25	34.602	0,4
Sustainable Development Reserve	7	19.430	0,2
Extraction Reserve	13	75.320	0,8
Private Reserve of the Natural Heritage	57	11.574	0,1
Subtotal	274	6.543.369	65,2
Total (PI+US)	528	10.029.712	100

Fonte: MMA 2012

Table 6. Number and area of conservation units in the Mata Atlântica

State with private partners and their joint liability in environmental preservation. In 2011, the P.E. of Mata do Limoeiro, M.N.E. Várzea do Lageado and Serra do Raio and the APA Alto Mucuri were the result of intense popular manifestations for the creation of these conservation units. It is also worth mentioning that within the targets of the Structuring Project "Preservation of the Cerrado and Recovery of the Mata Atlântica" the creation of protected areas exceeded the target set, with the area created in 2011 totalizing 346,188.69 ha, causing 16 public consultation processes that resulted in a decree creating 16 new conservation units (Table 7).

The state is conducting a survey on the effectiveness of the protection of biomes by Preservation Units, considering the CDB and IDPA Targets - (Index of the performance of public policy for environment)

Another positive example of creation of protected areas dedicated to the protection of endangered species is the conservations units in the Araucária Forest created in the years of 2005 and 2006 in the state of Santa Catarina e in the state of Parana. In October 2005 were created in the western region of Santa Catarina the Mata Preta Ecological Station with 6,563,00 ha, and the Araucária Nacional Park with 12,841,00 ha. In the state of Paraná were created both the Araucária Biological Reserve, with 14,919,00 ha, and the Perobas Biological Reserve with 8,716,00 ha, besides the Wildlife Refuge of the Campos das Palmas with 16,582,00 ha and the National Park of the Campos Gerai with 21,286, ha. The creation of these CUs meant the result of an

specific effort to deal with the last remains of the Mixed Ombrophylous Forest and of the associated highland field, which are the most endangered phitofisonamies of the Atlantica Forest.

As an example, regarding the endangered species, it is worth mentioning that the 10 National Forests existing in the Mixed Rainforest (Araucarias Forest) region in the states of Paraná, Santa Catarina, and Rio Grande do Sul, created in the 1940s with the purpose to implement araucaria reforestations to supply the wood market, now play an essential role in preserving this forest phytophysiognomy, and especially in preserving endangered species of flora and fauna and their genetic variability.

In the current context of the Araucarias Forest, this group of National Forests represents vital spaces for the preservation and survival of the regional biodiversity in the long term, including several species endangered in the flora, such as the Brazilian pine or araucaria (*Araucaria angustifolia*), black cinnamon (*Ocotea catharinensis*), Brazilian sassafras (*Ocotea odorifera*), palmtree (*Euterpe edulis*), xaxim (*Dicksonia sellowiana*), and the imbuia (*Ocotea porosa*) and species of commercial value such as the mate (*Ilex paraguariensis*), among many other species in this ecosystem. The National Forests also provide refuge to countless animal species such as the southern brown howler (*Alouatta clamitans*), red-belly toad (*Melanophryniscus dorsalis*), cougar (*Puma concolor*), otter (*Lutra longicaudis*), red myotis (*Myotis ruber*), solitary tinamou (*Tinamus*

UNIDADES DE CONSERVAÇÃO CRIADAS EM 2010 E 2011				
UCs	Quantidade	Área (ha)	% MG	Total UCs
PROTEÇÃO INTEGRAL				
Estação Ecológica	1	1.157,86	0,00	
Parque Estadual	4	8.974,85	0,02	
Refúgio de Vida Silvestre	1	9.750,40	0,02	
Monumento Natural	8	5.151,71	0,01	
Total (ha)		25.034,81	0,04	14
USO SUSTENTÁVEL				
RPPN	27	3.478,43	0,01	
APA	1	325.148,88	0,55	
Total (ha)		328.627,31		28
Total Geral		353.662,13		42

Tabela 7. Unidades de Conservação criadas em Minas Gerais nos anos de 2010 - 2011

solitarius), mantled hawk (*Leucopternis polionotus*), besides dozens of other species, many of which are endangered, rare, or endemic. This example shows the importance of protecting and recovering areas. As to the National Forests, it is necessary that the pinus trees (3,517 ha) planted in the area are cut down as soon as possible and the resources resulting from their trade are destined to a fund in benefit of the recovery of these areas with native species and to the maintenance of the National Forests themselves and other conservation units of the SNUC.

In Rio de Janeiro, the Costa do Sol State Park was created together with the definitive ruling for the creation of 15 states RPPNs, resulting in 10 thousand hectares of protected area in the state, only in the integral protection group. The Program of Support to Municipal Conservation Units – Pro-CU of the State Secretariat of Environment resulted in the creation of seven municipal APAs (38,420 ha) and eight integral protection municipal conservation unities (16.459 ha).

The Asa Branca- CE Association helped to create 4 Private Reserves of the Natural Heritage (RPPN) in the Mata Atlântica Biome, contributing to increase protected areas in this biome through the Project “Creation of a network of private reserves in the Maciço de Baturité”, supported by SOS Mata Atlântica. The RPPNs created are the RPPN Reserva da Cultura Permanente - Aratuba/CE – area of 7.62ha, RPPN Sitio Passaredo – Pacoti/CE – area of 3.61ha,, RPPN Belo Monte – Mulungu/CE – area of 15.70ha, RPPN Gália – Guaramiranga/CE – area of 55.98ha

According to a survey of the Conservation Units (UCs) of the Mata Atlântica conducted by the Network of Managers of conservation unities by Pernambuco Endemism Center, there are today 158 units built in the states of Rio Grande do Norte, Paraíba, Pernambuco and Alagoas and thirteen new areas are being created in the four states (Almeida, 2012), covering a total area of approximately 490,000 ha.

In Sao Paulo were also created important protected areas recently, like the State Park Itaberaba, Itapetinga State Park, State Forest Atibaia, Guarulhos State Forest, State Park of Restinga Bertioaga and

Area of Relevant Ecological Interest Itaguaaré, and about 100,000 hectares of remnants are being studied for the creation of new state and local conservation unities in the Mata Atlântica some of them in the final stage as the State Park Nascentes do Paranapanema with more than 25,000 hectares. The Table 9 shows the studies for the creation of new federal conservation units in progress in the ICMBio/MMA . Some studies have been completed for years and only await the execution of the presidential decree for their creation, as is the case of the Tibagi River Wildlife Refuge (PR), Rio da Prata Wildlife Refuge (SC), Pelotas River Wildlife Refuge (SC/RS), and the Campo dos Padres National Park (SC), among others. The majority of the studies conducted or ongoing provides for the creation of Integral Protection CUs. If this comes true, it would significantly increase the percentage of protected areas in categories of higher use restriction, today insufficiently represented in the SNUC.

Also important for the effective conservation and sustainable use of the Mata Atlântica Dominion is the creation of protected areas in coastal and marineadjacent zones where Brazil is particularly deficient

In this sense the Colegiado do Mar da RBMA (the Sea Collegiate – RBMA) , NGO Abrolhos Coalition and other social networks have mobilized and are demanding the Federal, State and Miunicipal Government extra efforts and priority in order to enhance the coastal and marine conservation unities, aiming at complying with the international goals assumed by the Brazilian government. These are the ecosystems the less protected in Brazil, and are among the first t be impacted by the global climate changes, either by the heating , or by the acidification of the sea water. In the ICMBio, among the conservation units whose creation processes are in an advanced stage and depend on the effort of the government to come to reality, we can mention: REVIS Peixe Boi (state of Ceará); APA Litoral (state of Ceará); APA Litoral Leste (state of Ceará); REVIS Praia do Forte (state of Bahia); REVIS Arembepe (state of Bahia); Extention of the PARNAM dos Abrolhos (state of Bahia); APA dos Abrolhos (state of Bahia/Espírito Santo); REVIS da Baleia Jubarte (state of Espírito Santo); RDF Foz do Rio Doce (state of Espírito Santo); PARNA + APA, Ilha do Francês (state of Espírito Santo); and REVIS Babitonga (state

CU's with studies completed and public consultations held	Proposed Category	State	Proposed Area in Hectares
REBIO Bom Jesus/Serra da Custódia	REBIO	PR	34.178
PARNA Guaricana / Rio Arraial	PARNA	PR	35.000
RVS do Rio Tibagi	RVS	PR	23.152
REBIO União – ampliação	REBIO	RJ	7.000
RVS do Rio Pelotas	RVS	SC e RS	258.276
RVS do Rio da Prata	RVS	SC e RS	33.591
PARNA Descobrimento - ampliação	PARNA	BA	1.549
PARNA Campo dos Padres	PARNA	SC	52.152
Litoral Sul de Sergipe ou Mangabeiras	RESEX	SE	30.000
Serra do Gandarela	PARNA	MG	39.391
Sub-total			514.289
CU's with studies completed awaiting public consultations			
Restingas Pratigi / Jataipeba	RVS	BA	6.784
Serras do Baixão e Bonita	RVS	BA	37.169
Serras do Itamarajú, Guaratinga, Jucuruçú	MONA	BA	197.033
Wenceslau Ubaíra	MONA	BA	41.838
Santo Antônio Belmonte	PARNA	BA	60.719
Serra Geral de Santa Catarina	RVS ou MONA	SC	68.750
Praia da Pipa	MONA	RN	11.103
Serra dos Poncianos	PARNA	SP e MG	25.000
Sub-total			342.902
CU's with studies in progress			
Banhado do Maçarico e cordões litorâneos	RVS	RS	68.435
Butiazal de Tapes e Lagoa do Casamento	RVS	RS	53.412
Dunas e Lagoas de Cidreira	PARNA	RS	47.357
Guaritas/Palmas e Rincão do Inferno	RVS e MONA	RS	239.872
Parques de Pau-Ferro	Não definida	RS	77.595
Santo Antônio Belmonte	RDS	BA	39.131
Massarandupió	Não definida	BA	8.115
Sítio do Conde, Costa Azul, Mata do Umbú	RESEX	BA	21.500
Mangue Seco	RVS	BA	29.066
Cordeiros Piripá	Não definida	BA	63.272
Bandeira / Pedra Azul	RVS	MG	13.935
Bandeira / Mamoneira (Limoeiro)	REBIO estadual	MG	19.121
Quadrado Pedra Azul, Mamoneira	Não definida	MG	187.052
Bandeira /Entufado baiano	PARNA/REBIO	BA / MG	27.072
Bandeira / Itambé	RVS	BA	35.338
Bandeira / Gravatazeiro (Complexo Santana Itapebi)	RVS	BA / MG	89.887
Jequié	Não definida	BA	66.086
Serra Jibóia	RVS	BA	10.993
Taquara	REBIO	BA	2.717
Sub-total		1.099.956	
Total Geral		1.957.147	

Table 9. Federal Conservation Units in study for creation in the Mata Atlântica

of Santa Catarina. The creation of the conservation units mentioned above will extend from 1.5% to approximately 4.3% of the Exclusive Brazilian Economic Zone, or 43% of the goal established by Brazil at the Biological Diversity Convention.

It is worth stressing that the Map of Priority Areas for Preservation and Sustainable Use and Sharing of Benefits of the Brazilian Biodiversity (Decree No. 5092/2004), prepared with the extensive participation of academic research institutions, NGOs, several economy sectors and public bodies of different levels, is an important tool of support to the creation of new conservation units. Another important document is the Atlas of the Fauna in Conservation Units – prepared with an ample participation of research academic institutions, of non governmental organizations, of several economic sectors and of the public organs in different levels, being a significant support tool to the creation of the new conservation units. Other state documents are also important, an example is the Atlas da Fauna em Unidades de Conservação (Atlas of the Fauna in the Conservation Units) designed by the IEF of Minas Gerais, The Biota Project that identifies priority areas for the creation of conservation units in São Paulo State. The Project Biodiversity in Rio Grande do Sul State and the Mata Atlântica Central Ecological Corridor in Bahia and Espírito Santo



CONCLUSIONS AND RECOMMENDATIONS

There is no doubt that the drop in deforestation rates and the beginning of the Mata Atlântica's regeneration is directly related to the great improvement of the environmental laws in Brazil, which started with the Forest Code, through the 1988 Constitution up to the Mata Atlântica Law (11.428/06). The Mata Atlântica Law supplemented the Forest Code, which protected permanent preservation areas and required a minimum legal reserve of 20%, and thus protected all remains of primary vegetation and secondary vegetation in the initial, medium, and advanced stages of regeneration, still existing. The use and suppression of primary vegetation was restricted only to works and activities of public utility, preservation practices, and scientific research, and still only in cases where there is no technical and location alternative. In the secondary vegetation in an advanced stage of regeneration, the use and suppression was also restricted to works and activities of public utility, preservation practices, and scientific research, in addition to allotments and buildings and mining activities and only in cases where there is no technical and location alternative. In the initial and medium stages there are also some events of suppression and use for social interest and to meet the basic needs of traditional populations and small farmers. In all cases of suppression of primary or secondary vegetation in the medium and advanced stages, except for medium stage suppression for small farmers and traditional populations, the compensation will be made upon the perpetual allocation of an area equivalent to the deforested area for protection. Another right aspect of the Mata Atlântica Law was the definitive prohibition of any and all wood exploration with business purposes (including endangered species) in the remains of native vegetation in the advanced and primary stages, and to the exception of pioneering species, also the medium stage of regeneration. The legislation, in addition to effectively contributing to the reduction of deforestation rates, is giving a chance for the fragments of remaining native vegetation to recover their structure and biodiversity due to the prohibition of general forest suppression and exploitation.

As evidenced, the Mata Atlântica already counts on a set of legal rules able to ensure the effectiveness of the CBD's goals and targets. Still, we are far from guaranteeing the effective protection of at least 17% of terrestrial areas and continental waters and 10% of coastal and marine area in systems of protected areas.

In this sense, to improve the protection of the biodiversity of the fauna and flora and the genetic diversity of species, according to goal C of the CBD, some strategies and actions are extremely important and urgent:

- a) extending the SNUC with the creation of new Conservation Units, both public (federal, state, and municipal) and private, representing all ecosystems;
- b) effectively implementing the Mata Atlântica Law and the Forest Code with the preservation and recovery of permanent preservation areas and legal reserves, as well as intensifying the inspection to eliminate depredation or deforestation actions;
- c) implementing and strengthening the management of existing Conservation Units and those to be created;
- d) establishing common strategies for the management of protected areas such as the creation and operation of PU mosaics, shared management of CUs between the authorities and organizations of the society, among others;
- e) establishing permanent funds, managed outside the single treasury account, that ensure basic resources for implementing and managing the CUs, in addition to resources from the treasury.
- f) significantly increasing the resources arising from the national treasury to ensure the effectiveness of the application of the laws and the implementation of conservation units, including area regularization.

STRATEGIC GOAL D: ENHANCE THE BENEFITS TO ALL FROM BIODIVERSITY AND ECOSYSTEM SERVICES

- **Target 14** - By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.
- **Target 15** - By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.
- **Target 16** - By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.



This goal addresses the ways to increase the benefits of biodiversity and ecosystem services for everyone, through the restoration of depredated areas, payment for environmental services and prevention of tragedies caused by adverse climate events. Also to be addressed is the potential of the Mata Atlântica region to mitigate the effects of climate changes through the regeneration and restoration of area, especially Permanent Preservation Areas (APPs) and Legal Reserves irregularly occupied in the past. Also to be discussed are the aspects related to the access to genetic resources and the sharing of the benefits arising from their utilization.

THE IMPORTANCE OF BIODIVERSITY AND ECOSYSTEM SERVICES

The ecosystem services are provided by nature in a silent, gratuitous, and continuous manner and bring a series of benefits to mankind, even though most people do not notice or acknowledge this.

Some of the services provided by nature are:

- regulation of the weather, reducing disasters such as flooding, droughts, and storms;
- maintenance of hydrological cycle, absorbing, filtering, and providing quality of water;
- prevention of soil erosion, keeping its structure and stability;
- production of oxygen;
- provision of spaces for houses, cultures, recreation, and tourism;
- maintenance of biodiversity, where mankind finds essential elements for the improvement of agriculture, production of medicine and cosmetics;
- maintenance of processes that human technology cannot master nor replace, such as pollination, photosynthesis, and waste decomposition;
- regulation of the chemical composition of the oceans.

Even in face of the drastic reduction, the natural resources of the Mata Atlântica still represent an incomparable richness in terms of biodiversity and environmental services, contributing to the maintenance of the basis for the sustenance and economic development and the quality of life and welfare of approximately 120 million people living in its domains. The Mata Atlântica protects soils and hills from erosion, regulates the weather in the cities and in the field, protects spring and rivers that supply

potable water to millions of Brazilians, provides pollinators to the agriculture, and further houses 60 out of 96 Ecotourism Center in Brazil due to its scenic beauty and the diversity of its landscapes, with natural and cultural attractions (MMA, 2010)¹.

Despite the scientific acknowledgement of its biological richness, even internationally, and its social-economic relevance to the country, the Mata Atlântica is in a critical situation, requiring urgent actions that involve different segment of the society seeking to ensure the effective protection of its remains and the recovery of part of its original vegetation. The actions for preservation and recovery should be done in a broader degree, at landscape level, in order to promote the connection between smaller fragments to larger areas, such as the conservation units, using legal reserves and permanent preservation areas as corridors for the species to transit through. For this, in addition to federal actions, it is fundamental for private owners, traditional populations, small-scale producers, and the state and municipal authorities to engage.

RESTORATION OF PERMANT PROTECTED AREAS AND LEGAL RESERVES

Among the areas that provide more essential services among those listed above are the so-called “permanent preservation areas” (APPs), defined under the effective Forest Code². These areas, located along bodies of water, steep slopes, and hilltops are “experts” in providing essential ecosystem services. A study by SPAROVEK et al. (2011), which mapped the total extension of the APPs in Brazil (103 million hectares) and compared it to its vegetation, identified a deficit of 44 million hectares (43%). According to this same study, the depredated area of legal reserves and permanent preservation units amount to 87 million hectares, about 10% of the national territory. The most depredated region is the Mata Atlântica, followed by the Caatinga and the Cerrado. If at least 15% of these areas were recovered by 2020, they would

represent 13.5 million hectares until 2020. Besides, their recovery is of the essence to reconnect forest fragments, link conservation units, and recompose protected areas.

To restore APPs and Legal Reserves is one of the most effective strategies to face the problem of fragmentation of the Mata Atlântica, contributing at the same time to mitigate climate changes through carbon capture, and further mitigate the effects of extreme climate events such as droughts and flooding. The recovery of said areas allows fragments to connect through the formation of ecological corridors and is vital to preserve the biodiversity and reestablish the genetic flow of species.

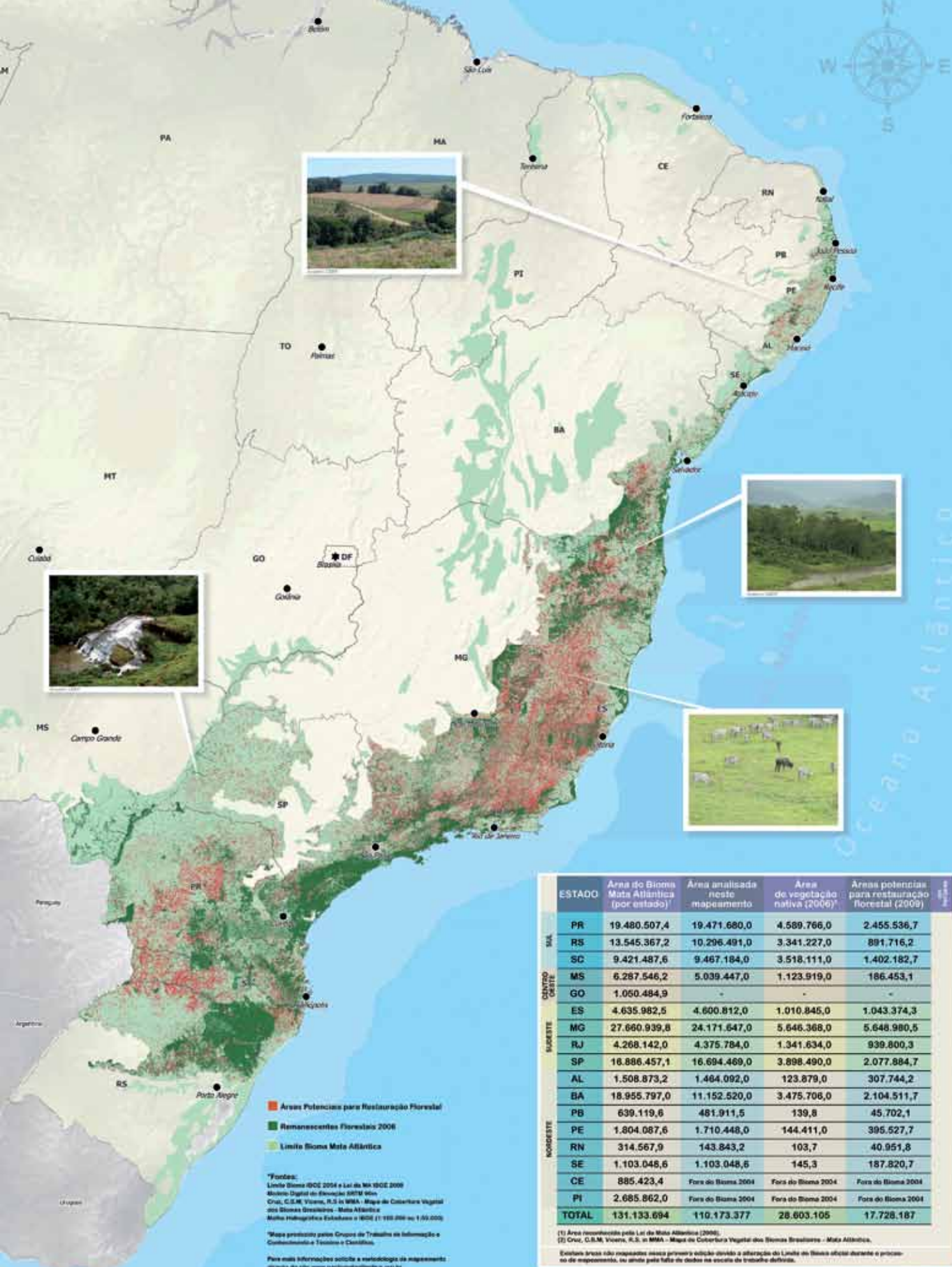
One of the most significant initiatives in this sense is the proposal of the Mata Atlântica Restoration Agreement, launched in April 2009, which targets the restoration of 15 million hectares of forests until the year 2050. With more than 200 members including civil society organizations, companies, research centers, and governmental bodies, the Agreement intends to gather efforts to restore the Mata Atlântica in a large scale and with quality, simultaneously promoting the preservation of biodiversity, creating work and income, legalizing agricultural activities, and providing environmental services critical for the economic development and welfare of more than 120 million people (Figure 7).

Initiatives such as the Agreement have shown that entering into partnerships is fundamental to achieve the targets established. As an example, we will address the wood and agricultural industries of the economy, which face problems and could mutually benefit from forest restoration. The wood industry complains of lack of raw material and space to plant forests. A significant part of the agricultural industry has environmental liability and is legally required to plant forests, having enough lands to do so, but many times underused and with low or zero agricultural or cattle production.

Through the joint work and mutual collaboration the problems of lack of raw material in the wood industry and environmental liability of the agricultural industry can be solved, concurrently

1 Campanili, M.; Schaffer, W. B. Mata Atlântica - Manual de Adequação Ambiental. - Brasília - DF : MMA/SBF,2010.

2 UICN, WWF-BRASIL e IPÊ. Metas de Aichi: Situação atual no Brasil. Ronaldo Weigand Jr; Danielle Calandino da Silva; Danielade Oliveira e Silva. Brasília, DF: UICN, WWF-Brasi e IPÊ, 2011.



ESTADO	Área do Bioma Mata Atlântica (por estado) ⁽¹⁾	Área analisada neste mapeamento	Área de vegetação nativa (2006) ⁽²⁾	Áreas potenciais para restauração florestal (2009)
SUL				
PR	19.480.507,4	19.471.680,0	4.589.766,0	2.455.536,7
RS	13.545.367,2	10.296.491,0	3.341.227,0	891.716,2
SC	9.421.487,6	9.467.184,0	3.518.111,0	1.402.182,7
CENTRO OESTE				
MS	6.287.546,2	5.039.447,0	1.123.919,0	186.453,1
GO	1.050.484,9	-	-	-
SUDESTE				
ES	4.635.982,5	4.600.812,0	1.010.845,0	1.043.374,3
MG	27.660.939,8	24.171.647,0	5.646.368,0	5.648.980,5
RJ	4.268.142,0	4.375.784,0	1.341.634,0	939.800,3
SP	16.886.457,1	16.694.469,0	3.898.490,0	2.077.884,7
NORDESTE				
AL	1.508.873,2	1.464.092,0	123.879,0	307.744,2
BA	18.955.797,0	11.152.520,0	3.475.708,0	2.104.511,7
PB	639.119,6	481.911,5	139,8	45.702,1
PE	1.804.087,6	1.710.448,0	144.411,0	395.527,7
RN	314.567,9	143.843,2	103,7	40.951,8
SE	1.103.048,6	1.103.048,6	145,3	187.820,7
CE	885.423,4	Fora do Bioma 2004	Fora do Bioma 2004	Fora do Bioma 2004
PI	2.685.862,0	Fora do Bioma 2004	Fora do Bioma 2004	Fora do Bioma 2004
TOTAL	131.133.694	110.173.377	28.603.105	17.728.187

■ Áreas Potenciais para Restauração Florestal
■ Remanescentes Florestais 2006
■ Limite Bioma Mata Atlântica

Fontes:
 Limite Bioma (IBGE 2004 e Lei de Nº 10000/2000)
 Modelo Digital do Elevação SRTM 90m
 Cruz, C.S.M., Vianna, R.S. in MMA - Mapa de Cobertura Vegetal dos Biomas Brasileiros - Mata Atlântica
 Mapa Hidrográfico Escala 1:100.000 ou 1:50.000

*Mapa produzido pelo Grupo de Trabalho de Informação e Comunicação e Tópicos e Clusters.

Para mais informações visite a metodologia de mapeamento através do site www.parqueatlantico.org.br

(1) Área reconhecida pela Lei da Mata Atlântica (2006).
 (2) Cruz, C.S.M., Vianna, R.S. in MMA - Mapa de Cobertura Vegetal dos Biomas Brasileiros - Mata Atlântica.
 Estas áreas não mapeadas neste primeiro mapeamento devido a alteração do Limite do Bioma oficial durante o processo de mapeamento, ou ainda pela falta de dados no escopo do trabalho definido.

Figure 7- Areas of potential forest restoration – Mata Atlântica Restoration Agreement

preserving biodiversity, mitigating climate changes, and providing environmental services essential to the society. Therefore, one must wish to discuss and search for the most appropriate solution for each region. It is certain that this would be a win-win situation, since planting forests is a great business not only to the wood industry, farmers or cattle raisers, but to the economy as a whole and for the population of the cities, who would have essential environmental services guaranteed.

There are several methods to promote area recovery. The simplest way is to interrupt the use of the area for agricultural or cattle raising purposes or to cause natural regeneration of the native species. Another way is through the planting of native species or also through the planting and simultaneous fostering of species arising from spontaneous regeneration. CONAMA Resolution 429/2011 provides on the methodology of recovery of permanent preservation areas and sets forth the methodology procedures for the restoration and recovery of these areas. The same methodologies can be applied to recover and restore legal reserves.

THE IMPORTANCE OF THE NGO'S WORK IN THE FOREST RESTORATION

The Mata Atlântica NGO Network, which currently congregates more than 300 NGOs, played a fundamental role in approving and regulating the Mata Atlântica Law and also in following up federal and state public policies. Many NGOs affiliated to the Network are developing works to capacitate and restore depredated Mata Atlântica areas. Since 1987, the Apremavi, in Santa Catarina, has a nursery of native seedlings where 700 thousand seedlings of more than 100 native species are produced every year to be used in the recovery of permanent preservation areas and legal reserved in the states of Santa Catarina and Paraná. In Minas Gerais, the Terra Institute, founded in 1999 by Lélia Deluiz Wanick Salgado and Sebastião Salgado, implemented a Center for Environmental Education and Recovery that trains professors, students, and people of the community, besides producing native seedling and promoting the recovery of depredated areas. In Bahia, the Bahia Environmentalist Group (Gambá³)

3 <http://www.gamba.org.br/>

follows public policies, capacity building and recovery of Mata Atlântica areas. In Rio de Janeiro, the Terra Institute for Environmental Preservation (ITPA⁴) has worked since 1998 on behalf of the sustainable development and preservation of areas inside conservation units, as well as the restoration of depredated areas. In Pernambuco, the Association for Protection of the Northeastern Mata Atlântica - AMANE⁵ develops the Green Energy Project, which restores depredated areas and performs the floristic characterization in the main fragment of the Serra do Urubu Forest Complex, a priority area for preservation and sustainable use of biodiversity in that region. In São Paulo, the Ecological Research Institute – Ipê⁶ develops the projects “Green Hug” and “Formation of Ecological Corridors” in the Pontal do Paranapanema region. Still in São Paulo, Fundação SOS Mata Atlântica⁷ has been developing the Clickarvore Program for more than 10 years, having already implemented 1300 restoration projects and registered 36 nurseries of native seedlings, benefitting 350 municipalities in 10 states. Besides the Clickarvore, SOS Mata Atlântica also develops the program Forests of the Future, which already planted more than 2,300,000 seedlings. There are also projects developed by traditional communities such as the Participative Environmental Management and Economic Development Project in the Quilombo de Ivaporunduva, in a partnership with the Social-Environmental Institute (ISA)⁸, which promoted the reforestation of 200 ha of forests with the jussara palm, besides developing organic banana production and ethnical-cultural tourism activities. In addition to these examples, many other NGOs perform successful works to recover and restore the Mata Atlântica.

THE WORK OF THE STATES IN FOREST RESTORATION

There are also state initiatives such as the Mata Atlântica Protection Project (Promata) of the Minas Gerais State Forest Institute, developed in cooperation with Germany, which has been

4 <http://www.itpa.org.br/>

5 <http://www.amane.org.br/>

6 <http://www.ipe.org.br/>

7 <http://www.sosmatatlantica.org.br/>

8 <http://www.socioambiental.org>

conducting experiences of payment to rural owners who preserve their forests. One of these places is the Baependi municipality, located in the Serra da Mantiqueira region, in the south of the State, where there are three important conservation units: the Serra do Papagaio State Park, the Itatiaia National Park, and the Mantiqueira Environmental Protection Area. Since 2007, about 2.9 thousand hectares of forest areas were recovered in approximately 240 areas using about 2.3 million seedlings produced in the family nurseries installed in the region. In 2010/2011, about R\$270,000 were allocated to 93 rural owners in that region. The initiative inspired the Green Grant Law, approved by the Minas Gerais Legislative Assembly in 2008. The Green Grant Program grants financial incentives to land owners and titleholders seeking to support the preservation of the native vegetation in Minas Gerais, upon payment for environmental services to land owners and titleholders that already preserve or have committed to recover the original native vegetation in their properties or possessions.

Minas Gerais government, at the challenge of internalizing the Strategic Plan for the Biodiversity 2011-2020 proposed the elaboration the State Plan for the Protection of Biodiversity, that is a sub project part of the strategic plan Conservation of the Mata Atlântica, Savannah and Caatinga coordinated by the Instituto Estadual Florestal (State Institute of Forest)..

In Paraná, the Program for Recovery of Depredated Environments (Surrounding Forest Program) coordinated by the State Secretariat of the Environment and Water Resources - SEMA and executed by the Paraná Environmental Institute in a partnership with the municipalities, State Secretariats of Agriculture and Planning, and with strong investment by the private initiative, has already planted more than 3.8 million seedlings and promoted natural regeneration through the abandonment of areas of more than 1,800 hectares. The recovered areas are mainly river mouths and margins. (Source: www.iap.pr.gov.br)

Several initiatives of civil organizations dedicated to the recovery and restoration of the Mata Atlântica are also being held, as the one held by the Grupo Ambientalista da Bahia - GAMBÀ (Bahia Environmentalist Group – GAMBÀ) at the

Recôncavo Sul Baiano by means of the Research and Management of the Wildlife – CPMVS, hosted at the Juquitiba Reserve comprising the municipalities of Santa Terezinha, Castro Alves, Varzedo e São Miguel da Mata, initiatives that resulted in the recovery with reforestation of 12 ha of degraded areas of APP in the Atlantic Forest.

These are but a few examples of ongoing initiatives that prove that recovering the Mata Atlântica is a feasible possibility.

PAYMENT FOR ENVIRONMENTAL SERVICES (PSA)

One of the most important and modern positive incentives is the payment in exchange of environmental or ecosystem services. One of the first legal rules in this sense appeared in 2000, with the Law of the National System of Conservation (SNCU), which instituted the financial contribution to the CUs to be paid by water distribution and power generation companies or by other companies that use water supplied by preservation units. This is a potential source of income for the CUs, but still needs regulation of the law for its future application.

Currently in Brazil, initiatives of payment for environmental services are multiplying rapidly, whether private: coordinated and financed with resources from companies and NGOs; or public: driven and financed by the many levels of governments (municipal, state, and federal). A study of the Ministry of the Environment published in the book *Pagamentos por Serviços Ambientais (PSA) na Mata Atlântica: lições aprendidas e desafios* (MMA, 2011), indicated the existence of 41 water-related PSA projects, 33 carbon-related, and 5 biodiversity-related.

In the water protection field there are already programs for payment of land owners, as in the municipality of Extrema, Minas Gerais, where the city government compensates rural producers that maintain or recover Permanent Preservation Areas (APPs) in the microbasins of the municipality. Another example is in the São Paulo Metropolitan Area, where the Fundação O Boticário has a project that benefits those who preserve the Mata Atlântica in properties inside water source areas.



The São Paulo Environmental Program, through its many bodies, such as the State Secretariat of the Environment, has been promoting, under the Green Belt Biosphere Reserve, actions for the creation and maintenance of positive incentives to preserve and recover biodiversity, with financial incentives such as the Payment for Environmental Services (Project Mina d'água), Project for the Recovery of Surrounding Forests, among several other programs, projects, and action existing currently in progress in the São Paulo environmental agenda. The Project Green and Blue City is another very important state initiative, since besides promoting incentives for the protection and sustainable use of biodiversity in the São Paulo State municipalities, it also works the integration and articulation between the bodies of the state and municipal spheres.

In Paraná, the Environmental Education and Wildlife Research Society (SPVS) is developing a project jointly with the NGO The Nature Conservancy (TNC) and companies in the power and automobile industries, for the acquisition of an area of approximately 19,000 hectares in the Serra do Mar region, which is being preserved. Besides the capture of carbon, which contributes to minimizing the effects climate changes, the areas protected by the SPVS provides several other environmental services, especially maintaining the biological diversity of plants and animals; maintaining the quality of ecosystems and ecological processes in the region; supply quality water to the urban population of Antonina (18 thousand people) and communities of Ilha Rasa (600 people), who collect water from the SPVS reserves. In Rio de Janeiro, the Payment for Environmental Services chosen by a public bidding promoted by the Paraíba River Basin Agency (Agevap) made it possible for 39 farm owners to receive an amount between R\$10.00 and R\$60.00 each per hectare on a monthly basis to keep planted areas in their properties.

There are also forms of payment for the preservation of biodiversity in other states. As in Minas Gerais, the Green Grant Program, instituted by Law Lei 17.727, dated August 13, 2008, and regulated by Decree 45.113, dated June 5, 2009, supports the preservation of the native vegetation upon payment for environmental services to owners and titleholders that already preserve or have committed to recover the native vegetation in their properties or possessions. The financial incentive is proportional to the size of the preserved area. Those who preserve more up to limit of hectares corresponding to four taxes modes in their respective municipality will receive more. In 2010, its first year of operation, the Green Grant Program allocated more than 5 million Reais to 869 land owners who each had their share deposited into a current account.

The preservation of the scenic beauty of the Mata Atlântica is also beginning to be valued as an environmental service, as in the south of Bahia, where Instituto Floresta Viva and the Txai Resort are developing a project that compensates farmers who preserve fragments of the Mata Atlântica, acknowledging that as an attractive to increase tourism.

Still in a state level, the payment program for environmental services in the state of Espírito Santo is one of the first in Brazil sited at Fundágua – State Fund for Water Resources of the State of Espírito Santo, constituted by 3% of the resources from the oil and gas royalties received from the State. There are two projects running: Producers of Water and Forest for Life, executed by the State Institute for Environment (IEMA), and a broader program in the state level, Reforest, launched in 2001, still in its phase of initial execution This program counts on several partner entities, among them IEMA and INCAPER. Another state that has already enacted the state law on Environmental Services Payment is Santa Catarina. It is Law 15,133/10 that established the State Program for Environmental Services Payment aiming at implementing, conserving managing, protecting, reestablishing recovering and improving ecosystems that generate environment services. These payments will occur by means of three sub programs: conservation units, vegetal and water formations.

In the national level, Bill of Law No. 792/2007 and its exhibits are being discussed, seeking to institute a National Policy of Payment for Environmental Services, create a PSA national program and fund. Although the national policy is still being discussed in the federal sphere, many states and municipalities already approve specific laws for the PSA.

Another state that has already enacted the state law on Environmental Services Payment is Santa Catarina. It is Law 15,133/10 that established the State Program for Environmental Services Payment aiming at implementing, conserving managing, protecting, reestablishing recovering and improving ecosystems that generate environment services. These payments will occur by means of three sub programs: conservation units, vegetal and water formations.

RELATIONSHIP BETWEEN ECOSYSTEM SERVICES AND DISASTERS

To ensure ecosystem services it is necessary to protect or recover areas that protect river mouths and water springs, control the erosion, and avoid landslides, among others. The permanent preservation areas, especially those located by margins of water courses, slopes, and tops of hills, mounts, mountains, and ridges, generally coincide with areas that provide relevant ecosystem services and at the same time are environmentally vulnerable and risky, and their occupation with agricultural activities or buildings jeopardizes the ecosystem services and the safety of the residing people. The welfare of human populations will only be guaranteed if these populations are not subject to the risks of flooding, landslides, shortage of water, pollution, or other environmental unbalances and are able to enjoy a harmonious and balanced landscape.

This is only possible if the vulnerable and dangerous areas are not occupied with building or agricultural activities, and at the same time have their native vegetation duly preserved and protected.

It is widely evidenced that even small rivers, especially those with no protection of the

surrounding vegetation, overflow due to torrential rains, and likewise the hills and slopes occupied by man through agricultural activities, infrastructure works or cities are the most susceptible to landslides, impacting those that reside in or occupy permanent preservation areas. There are more than sufficient examples, as in the cases of tragedies such as the one that affected the mountainous area of Rio de Janeiro in early 2011, or the Itajaí Valley, in Santa Catarina, in late 2008.

The legal scholar and current Minister of the Superior Court of Appeals Antonio Hermann Benjamim (Campanili & Schaffer, 2010) teaches us that the best way to prevent risks is not occupying these areas. "The only way to avoid social and economic losses, including the loss of human lives, caused by flooding and landslides is to not occupy or reside on steep slopes and by the margins of rivers and streams. Although this seems obvious, sadly it is ignored by a significant part of the population (and not only the poor population), the majority of the authorities, and also by the press that covers these tragedies. There are still those who believe that channeling rivers prevents and avoids floods, when in fact it sets real time bombs that will explode later on".

For example, a study by the Ministry of the Environment made in the area hit by the tragedy that affected the mountainous of Rio de Janeiro, in January 2011 (Schaffer et al., 2011), assessed that 92% of the areas hit by landslides had some human interference, whether in the slope, by the foot or on top of the hill. The study also indicated that the number of landslides occurred in areas with a well-preserved native vegetation represented only 8% of the total, a number significantly lower than on anthropized areas (agricultural areas, pastures, populated areas). Likewise, out of the flooded areas more than 70% were located inside the permanent preservation areas established by the Forest Code.

ACCESS TO GENETIC RESOURCES AND THE FAIR AND EQUITABLE SHARING OF THE BENEFITS ARISING FROM THEIR UTILIZATION

Brazil has been a pioneer in promoting the rights of the traditional populations as related to the goods produced from their knowledge, as set forth in Article 8j of the CBD. Provisional Measure (MP)

2.186-16/2001 acknowledges that the associated traditional knowledge is part of the Brazilian cultural heritage and establishes rights to the local and indigenous communities. Said MP sets forth that the access to the country's genetic resources can only take place upon authorization of the Government and it is illegal to use associated traditional knowledge without the consent of those who hold it and the Genetic Heritage Management Council (CGEN)⁹.

Since its organization, the CGEN has published many Technical Instructions and 34 Resolutions for the proper implementation of the Provisional Measure, all electronically available at www.mma.gov.br/cegen. Until mid-2009, more than 200 projects requesting access to genetic resources and/or associated traditional knowledge were approved by the Council. The institutions that receive licenses to access are required to submit annual reports to the CGEN and are subject to cancellation of the license and legal sanctions if any misuse is identified.

Despite significant legislation, Brazil has the challenge to bring it into effect and at the same time ensure the access to genetic resources and the rights of the traditional populations and indigenous peoples. "The rules for benefit sharing have been defined by Provisional Measure 2.186-16/2001. However, since the rules of compliance with the legislation are complex and hard to implement, the sharing of benefits is still incipient. Since 2002, when the CGEN came into operation, 25 benefit-sharing agreements were executed and approved" (BRASIL/MMA, 2010).

The deficiencies in the control and inspection systems further allow for an intense process of biopiracy involving species of the flora and fauna, many in the Mata Atlântica.

⁹ CGEN is a collegial body, composed of Environment Ministry, Ministry of Science and Technology, Ministry of Health, Ministry of Justice, Ministry of Agriculture, Livestock and Supply, Ministry of Defence, Ministry of Culture, Ministry of Foreign Affairs, Ministry of Development, Industry and Foreign Trade, IBAMA, Rio de Janeiro Botanical Garden Research Institute, the National Council for Technological Research, National Institute of Amazonian Research, Embrapa, Oswaldo Cruz Foundation, Instituto Evandro Chagas, National Indian Foundation, National Institute of Intellectual Property and the Palmares Cultural Foundation. Furthermore, CGEN included the participation of other sectors such as indigenous communities, local communities, social and environmental NGOs, the private sector (companies), academia, and federal prosecutors.

Common Name/Inglês	Scientific name	Value in U\$\$/Gram
jararaca/jararaca	<i>Bothrops jararaca</i>	433
Urutu/urutu	<i>Bothrops altermatus</i>	1,835
Surucucu-pico-de-jaca/ bush master	<i>Lachesis muta muta</i>	3,200
Cora-verdadeira/coral snake	<i>Micrurus frontalis</i>	31,300
Aranha-marrom/ brown spider	<i>Loxosceles sp.</i>	24,570
Escorpião/yellow scorpion	<i>Tilyus serralatus</i>	14,890

Fonte RENTAS 2002

Table 10. Value of the international market gram of substances extracted from some Brazilian animals

Studies conducted by the RENTAS (National Network of Combat to the Trafficking of Wild Animals) on the trafficking of Brazilian animals show that many species of snakes, spiders, scorpions, some insects and amphibians have a high market value for biomedical studies due to the active principles existing in their venoms and other substances that can be extracted from them.

It is worth stressing out that not all trafficking of animals and their products are biopiracy, but all biopiracy is trafficking. This modality operates large amounts of money. The venom of the wandering spider (*Phoneutria sp.*) is being studied to originate an efficient painkiller, and may be worth US\$4.000 a gram when it becomes a medication (Coutinho, 2001).

Table 10. shows the high per-gram value in the international market of substances extracted from some Brazilian animals, all of which are found in the Mata Atlântica.

Poisonous snakes such as the jararaca (*Bothrops sp.*) are of great value to the biomedical market (as per the table). The golden lancehead, *Bothrops insularis*, in critical risk of extinction, due to being endemic of the Queimada Grande Island, in the State of São Paulo, is particularly threatened by the illegal commerce, with a demand for creation in captivity and studies of its venom (Faria, 1999).

Among the cases reported for resources of the Mata Atlântica is the venom of the Jararaca (*Bothrops jararaca*), whose action against hypertension was evidenced by a research developed in Brazil in the 1970s, which originated the Captopril drug, patented by the Squibb laboratory.

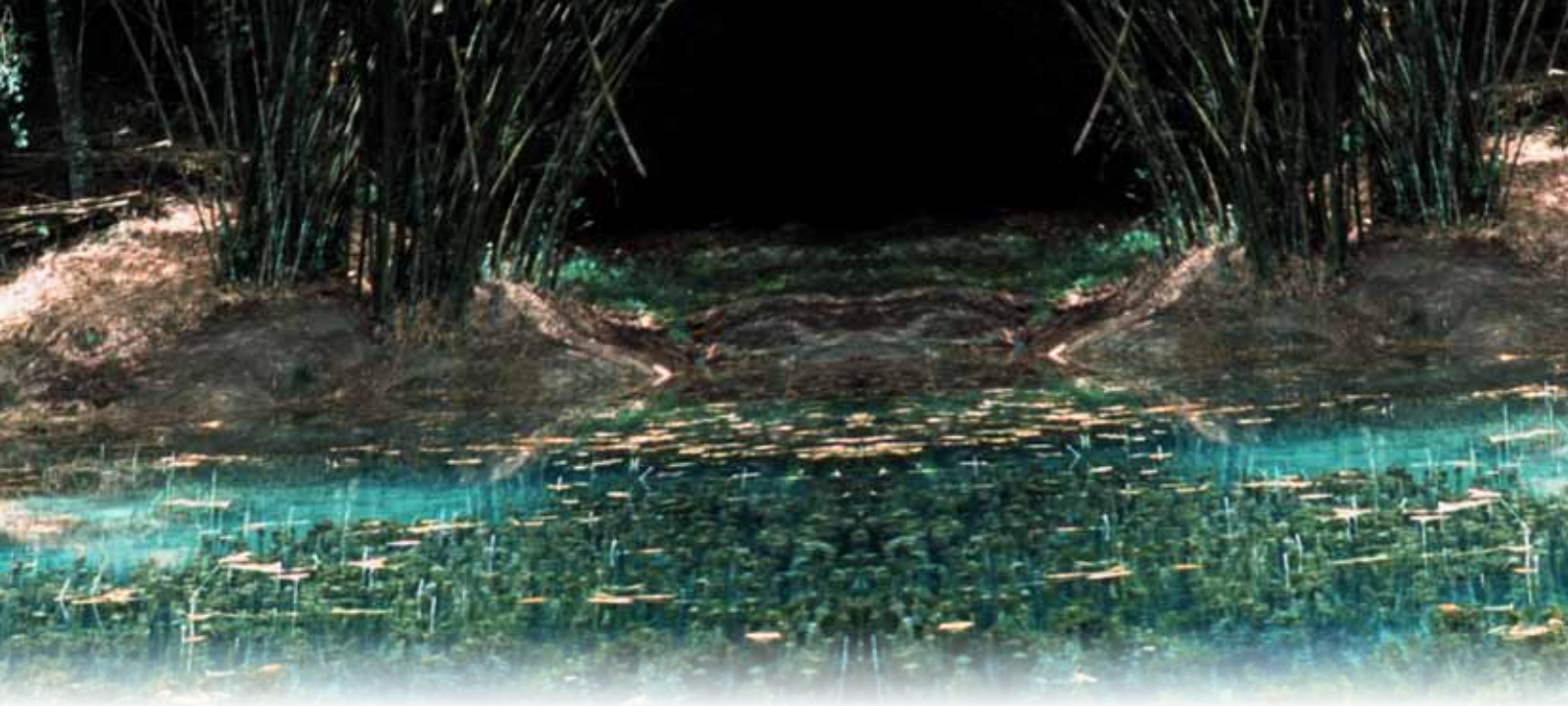
Among the plant are the Jaborandi (*Pilocarpus pennatifilius*), an exclusive Brazilian species that had its patent filed by the German industry Merck in 1991, and the mayten (*Maytenus ilicifolia*), typical of the southeast and southern Mata Atlântica, which provides its extract to a drug patented by the Japanese company Nippon Mektron in 1996.

The case of the mayten is a perfect example to demonstrate not only the process of biopiracy and patenting of a species without consent of the country of origin, but also the disrespect to the associated traditional knowledge, since its tea is a popular medicine to cure stomach problems, a quality scientifically proven since the 1920 decade through a research that evidenced the plant's action against ulcers.

It was also from the traditional use of a typical Mata Atlântica species, the baleeira herb (*Cordia verbenacea*), that the first phytotherapeutic medicine fully manufactured from a native plant in the country was produced, the inflammatory Acheflan, traded by the Brazilian laboratory Aché since 2005.

In this case, the services of the researchers involved (Federal University of Santa Catarina) were compensated but there is no forecast that any royalties will be paid to them or that any benefits will be shared among any community whose traditional knowledge is associated to the use of the medicinal plant.

Some legal rules and government programs have contributed to reinforce the community rights to genetic resources, such as Decree 6.047/2007, which provides for the "National Policy of



Sustainable Development of the Traditional Peoples and Communities”, the “Agricultural Biodiversity Program” coordinated since 2008 by the MMA jointly with the MDA, MDS, CONAB, and EMBRAPA, as well as the National Policy of Medicinal Plants and Phytotherapeutics (2006), which established the directives and priority to ensure the safe and rational use of these products in the country.

Over the last years, many Resex and RDS were created in the Mata Atlântica, but there is still no systematic work of identification, mapping, and formal recognition of the traditional communities. The recognition of these cultures, their relation with the territory and their natural resources are a key issue to preserving the biodiversity and achieving the benefit-sharing targets established in this component.

In order to minimize the loss of genetic variability, either in cultivated plants, domestic or wild animals it is necessary to implement and create innovative techniques that allow for the creation of vegetal and animal germplasm banks. Considering the importance of genetic variability, it will be installed in Ceará the first bank of active germplasm of forest essences of the state, in the Ceará Botanical Park – a unit in process of adjustment to the National System of Nature Preservation Units (SNUC).

CONCLUSIONS AND RECOMMENDATIONS

The payment for environmental or ecosystem services is one of the positive incentives that can contribute a lot to the protection and recovery of ecosystems, especially to the restoration of permanent preservation areas (APPs) and Legal Reserves. In the case of the Mata Atlântica, the recovery of APPs and RLs is fundamental to reconnect the thousands of small fragments of native vegetation and may concurrently contribute to the mitigation of climate changes through carbon capture, preservation of biodiversity and reestablishment of the genetic flow of the species, in addition to mitigating the effects to extreme climate events such as droughts and floods.

Therefore, it is essential to maintain the current sections and parameters of APPs established by the Forest Code and to support and implement environmental restoration programs between public and private entities, universities, forest companies, social organizations, farmers, and others, as in the proposals of the Mata Atlântica Restoration Agreement.

The data also show that the Mata Atlântica region, after being a villain in carbon emission in the past, currently has great potential of becoming one of the main solutions for the correct equation of this problem in Brazil. For this, it is necessary to maintain the current strictness of the legislation and implement it, especially to wipe out



deforestation, significantly increase the protected area in preservation units representative of all ecosystems, not allow any commercial wood exploration in the remainders to be resumed, and at the same time demand the recovery of Permanent Preservation Areas and Legal Reserves irregularly depredated and occupied with agricultural or any other activities.

It is also necessary to support the research and increase technical assistance seeking to create new knowledge and technologies, such as the agricultural forest systems, for the different environments by using native species with good genetic and physiologic quality, including for economic production. Another relevant aspect is to extend and improve the existing credit facilities and programs of payment for environmental services, to develop activities of restoration with native species and agricultural forest systems focused on the production and environmental recovery.

The work of the NGO in capacity building and disclosure of information on environmentally correct practices and also in the direct action, whether to restore areas, research, or mobilize partners, is extremely relevant and should be supported and strengthened.

The states and municipalities must perform ever more proactively to preserve the biodiversity, implementing and improving state and municipal systems of preservation units representative of their

territories, in addition to providing support to land owners for environmental adjustment, especially regarding the aspects of the Forest Code. At least one preservation unit per municipality is a goal to be achieved until 2020.

To achieve this in a national level it is necessary to discuss and approve the Replacement to Bill of Law No. 792/2007, which seeks to institute a National Policy of Payment for Environmental Services and create a PSA national program and fund.

As to the genetic resources, among the main priority strategies to achieve the targets related to the access and sharing of biodiversity benefits and associated traditional knowledge are: a) the search for a “*suigeneris*” legal system of protection to traditional knowledge that observes the legal pluralism and the peculiar systems of representation of the indigenous and traditional population, and b) the delimitation of indigenous lands and the creation of Protected Areas of Sustainable Use, especially Extraction Reserves - RESEX and Sustainable Development Reserves – RDS, that can identify genetic resources of the territory, communities that hold associated traditional knowledge, and where more simplified legal manners to ensure the consent to access the resources and associated knowledge are available, as well as to establish fair procedures of sharing of benefits arising from this Heritage.

STRATEGIC GOAL E: ENHANCE IMPLEMENTATION THROUGH PARTICIPATORY PLANNING, KNOWLEDGE MANAGEMENT AND CAPACITY BUILDING

- **Target 17** - By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.
- **Target 18** - By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.
- **Target 19** - By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.
- **Target 20**- By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization, should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties.



This goal addresses matters related to the mainstreaming and action plans related to the preservation of biodiversity under the different public policies and administrative spheres. Also addressed is the importance of the biodiversity-related scientific knowledge and its sharing. In addition, we will discuss the mechanisms to implement public policies such as funds and programs, as well as financing sources.

BIODIVERSITY AND PUBLIC POLICIES

The National Biodiversity Strategy and Action Plan for 2020 is in its preparation phase through the Biodiversity Dialogues, an effort that involves governmental bodies and NGOs in the many levels of society.

Currently, the main development indexes (GDP and HDI) do not incorporate the values of biodiversity. However, at least in theory, the National Development Agenda (AND) approved by the Social and Economic Development Council (CDES) sets forth that “the environmental sustainability and the protection of biodiversity are also assumptions of the national development project and shall govern every action and initiative of the governments, private companies, and other organizations of the society. One of the strategic directives of the AND is to “provide the national public apparatus with an effective ability to inspect the handling, conservation, and preservation of natural resources and the environmental quality, and to mobilize the entire national capacity of scientific and technological development aiming at the production of knowledge, conceptions, methods, and technologies that allow for the sustainable handling and preservation of our natural resources” (BRASIL/CDES, 2007, p. 20).

However, in the practice, the efforts are insufficient, if not in the opposite direction as the evaluations of federal public policies indicate, and the biodiversity continues to be understood as a restriction instead of a basis for development.

Even the climate agenda, which through the National Climate Changes Law – PNMC (BRASIL, 2009b) provided for the preparation of sectorial plans that incorporate the reduction of greenhouse gas (GEE) emissions, has been halted. In addition, the integration between the PNMC and biodiversity is still weak: for example, the PNMC sectorial plans could accommodate actions for the preservation and sustainable use of biodiversity. Thus, since the Ministry of Mining and Energy (MME), Ministry

of Development, Industry and Trade (MDIC), and the MAPA were required to prepare sectorial plans to reduce carbon emissions, it would be reasonable if these ministries and others would concentrate on the matter of biodiversity to prepare sectorial plans for the development with reduced losses of habitat, species, and genetic diversity.

The federal government itself admits that:

The mainstreaming of biodiversity-related matters remains one of the biggest challenges. The National Biodiversity Committee (CONABIO) is a part of the effort to facilitate the dialogue with other sectors and raise awareness to the importance of preserving the biodiversity, but the penetration of biodiversity matters discussed by representatives of the Committee in other sectors is much less effective than expected.

The project PROBIO II (National Project for Mainstreaming of Biodiversity and Institutional Consolidation), currently being implemented, is one of the main instruments to put into practice the integration of biodiversity matters in other sectors. The project involves 10 public agencies in the environmental, health, agriculture, science, and technology sectors, each with biodiversity-related goals established through the project (BRASIL/MMA, 2010).

The economic incentives may become strong drivers of the economy towards sustainability. Unfortunately, in Brazil, positive economic incentives are still insufficient. An example is the ecological ICMS¹, a strategy that seeks to incentive municipalities to adhere to the preservation agenda. It favors municipalities with a larger extension of protected areas with an additional income of resources arising from the ICMS. This income is significant to some municipalities.

Based on art. 158 of the Constitution, the State of Paraná was a pioneer in creating the Ecological ICMS as a form of "compensation" to municipalities with large areas still covered with native vegetation with many legal restrictions to the expansion of their economic (classic) activities. The pioneering of Paraná was replicated in other states of the

Federation, which started to enact laws with the same purpose, each binding the allocation criteria that best suited the interests of the local population and their particularities, such as: existence of preservation units, sources of water for public supply, environmental sanitation, selective curbside collection, preservation of historic heritage, indigenous reserves, and so on ("Histórico no Brasil - ICMS ecológico", [S.d.]).

In Minas Gerais, the ecological ICMS, instituted by Law No. 12.040, dated December 28, 1995 and popularly known as the Robin Hood Law, uses three subcriteria to allocate resources: basic sanitation; preservation units, and Dry Forest index. The preservation units subcriterion corresponds to 45.45% of the percentage destined to the environment, favoring municipalities that have in their area federal, state, or local preservation units of any handling category according to Law 9985/2000 - SNCU registered by the applicable body. In 2011, the municipalities enrolled to receive that Ecological ICMS were allocated a total R\$ 66 million.

In the federal level, an interesting example of positive incentives to biodiversity is the National Plan for the Promotion of Social-Biodiversity Product Chains (PNPSB) (BRASIL/MMA, [S.d.]; CONAB, [S.d.]). The PGPM is under the responsibility of the MAPA and operated by the National Supply Company (CONAB). The follow-up and analysis of the operations have the participation of a decision instance involving the MMA, MAPA, MDA, Ministry of Finance (MF), Ministry of Planning, Budget, and Management (MPOG) and the CONAB. Four products of the Mata Atlântica are included in the CONAB's list: pine nut, jussara, piassava and mate.

The Strategic Plan for Development of the Fishing Productive Chain in Mato Grosso do Sul systematizes the strategy agreed in the Grande Dourados Territory to increase fishing production in a sustainable manner, thus establishing a closed fishing period when the fishing activities in the MS rivers is prohibited, during the reproductive period of the main species explored in the commercial and sports fishing.

As to incentives that negatively impact biodiversity, it can be said that the credits subsidized from the government to economy, including loans of

1 State Sales Tax

the National Economic and Social Development Bank (BNDES) and the resources of constitutional funds, can be harmful to biodiversity when not incorporating social-environmental standards. Even normal credit, with no safeguards, can be a negative incentive.

The main Brazilian banks have adhered to the "Equator Principles", a set of environmental standards that should be applied to large projects, but the agricultural credit, usually in smaller amounts, is not subject to the same criteria. On the other hand, the MMA and five banks have signed the Green Protocol: a series of commitments of financial institutions with the promotions of sustainable practices in loans granted. However, despite the Legal Reserve and Permanent Preservation Areas having been legally instituted by the 1965 Forest Code, many farm owners did not preserve them. The absence of penalties arising from the non-compliance thereto has contributed to this lack of adherence to the rule. When finally a term and penalties were created in 2008 through Decree 6514 to those who did not have the Legal Reserve registered, the most retrograde ruralist sectors reacted and forced successive extensions of this term, thus adjourning the effective date of the requirement from 12.11.2008 to 06.11. 2012.

THE STATES' PARTICIPATION IN THE IMPLEMENTATION OF THE CBD

São Paulo is one of the most advanced states as regards the integration of biodiversity-related matters into the many government bodies. To increase the environmental management in the state, in 2007, 21 Strategic Environmental Programs were created to work environmental agendas in different areas such as minimum waste, treated sewerage, quality of the air and superficial and underground waters, ecotourism, environmental education, decentralization of the environmental policy in partnership with municipalities, reduction of burns of sugarcane straw, recovery of surrounding forests, and unified environmental licensing. So that these project achieve their targets, the Secretariat of the Environment works together with other state government bodies, and also enters into partnerships with city governments, private sector, NGOs, and learning and research institutions.

As a regional instance, the State of São Paulo play a pioneer role in publishing several legal diplomas such as State Law 13.550/2009, which protects the Cerrado biomes, and Decrees 51.170/2005 and 53.336/2008, which instituted the certification of the programs and projects of the state public administration. It also instituted the State Climate Change Policy in 2009, driving the enactment of the National Climate Change Policy. In this law, the state instituted instruments such as the Payment for Environmental Services and the target of 20% reduction in the emission indexes of 2005. São Paulo is also a groundbreaker in establishing measures of protection of marine ecosystems through a Marine Zoning with excluding fishing areas.

To monitor the status of biodiversity in the state, the Secretariat of the Environment released in 2010 the publication "Biodiversidade no Estado de São Paulo", showing the advances already achieved and an overview of the current situation related to the CBD's goals and targets. This is an important initiative that should be adopted by all other states in the Mata Atlântica.

Another example of integration and work in partnership comes from Santa Catarina, where, under the coordination of the Apremavi and with partners such as the Environment Foundation - FATMA and the ICMBio, the project "Integration and Capacity Building of Councils and Communities and in the Joint Management of Federal and State Conservation Units (CUs) – Western SC and Central-Southern do PR", with the support of the Demonstrative Projects Subprogram - Mata Atlântica PDA of the Ministry of the Environment. The project trains managers and communities around 4 federal and 2 state CUs geographically close to each other: the Chapecó National Forest, in the municipalities of Chapecó and Guatambu (SC), Mata Preta Ecological Station in Abelardo Luz (SC), Araucárias National Park in Passos Maia and Ponte Serrada (SC), Campos de Palmas Wildlife Refuge in Palmas and General Carneiro (PR), Araucárias State Park in Galvão and São Domingos (SC) and Fritz Plaumann State Park in Concórdia (SC). Works along these same lines are being developed also by the Mata Atlântica Research Institute – Ipema, in Espírito Santo, and the Mater Natura Institute, in Paraná.

THE IMPORTANCE OF SCIENTIFIC KNOWLEDGE

The learning and research institutions play a fundamental role in producing and conveying quality content to increase the degree of awareness and incorporation of environmental matters in the daily life of each citizen. On the other hand, the adoption of speeches and practices to direct sustainability by the governments of every level and the many spheres of authority (Legislative, Executive, Judiciary, and the Attorney General's Office) is equally critical and indispensable for the search of sustainable development.

According to the publication "Avaliação do Estado do conhecimento da Biodiversidade Brasileira" (Lewinsohn, T.M., 2005) (State Evaluation of the knowledge of the Brazilian Biodiversity (Levingstone, T.M. 2005)), the Mata Atlântica is the most recognized set of ecosystems and with the largest number of evaluated taxonomies of plants, vertebrates and terrestrial invertebrates. Another important general inventory is the "Lista de Espécies da Flora do Brasil", (MMA, 2010) with over 40,000 plants of the many national biomes.

The book "Plantas da Mata Atlântica" (Stehmann et al, 2009) (Mata Atlântica Plants (Stehmann et al, 2009)) brings the complete list of the 15,782 species of the Mata Atlântica (Table 2), distributed along 2,257 genera and 348 families, of which 132 genera (6%) and 7,155 species (45%) are considered endemic of the Mata Atlântica. This group represents about 5% of the entire global flora, estimated in about 300,000 species (Judd et al, 2009). Out of these species, in the Mata Atlântica 14,522 vascular plants were described, of which 6,933 species, almost half (48%) of the total known, are considered endemic of the region.

Despite the Mata Atlântica standing out for

comprising the largest number of researches and knowledge on its biodiversity, it is still far from being fully known. An example is the fact that more than 1,000 new species of angiosperms were discovered in the Mata Atlântica in the last two decades, which represents 42% of the total angiosperms described in Brazil in this period (Sobral & Stehmann, 2009). This last author also indicates that only in the last three years, more than 300 new species in this group were described to the Mata Atlântica, in their majority endemic of the region.

The high degree of endemism of the Mata Atlântica is overcome only by other five biodiversity hotspots in the world (Andes, Sunda, Mediterranean Basin, Madagascar, and Indian Ocean Islands) (Myers 2000; Mittermeier et al. 2004). This characteristic requires an even higher number of experts and a high degree of scientific exchange and accessibility to the reference data.

Some initiatives contribute to increase the knowledge on the Brazilian biodiversity, as in the Program for Modernization of the Biological Collections, of the National Program of Capacity Building in Taxonomy, of the Biodiversity Research Program (PPBIO), of the Program of Molecular Identification of Biodiversity (BR-Bol), of the National Program of Biological Inventory and the National System of Biodiversity and Ecosystem Information (SIB BR), coordinated or supported by the Ministry of Science and Technology (MCT).

Among the state initiatives worth of mention is the Biota /FAPESP Program, of the State of São Paulo, a groundbreaking program that integrates hundreds of researchers and produced the most complete assessment on the biological diversity of a State of the Federation, in its large area included in the Mata Atlântica. The Biota/FAPESP, which works as the Virtual Institute of Biodiversity in São Paulo, is



the reference for the creation of the Biota/Brasil program.

Another important initiative is the Project Floristic-Forest Inventory of Santa Catarina, a state government initiative executed by the Secretariat of Agriculture and Rural Development (SAR), Regional University of Blumenau (FURB), Federal University of Santa Catarina (UFSC) and the Agriculture and Rural Extension Research Company of Santa Catarina (EPAGRI). Between the years of 2005 and 2010, the project made the inventory of the forest resources and the floristic assessment of the diversity of all vascular plants existing in the forests of Santa Catarina.

The development of basic scientific researches on biodiversity, such as the identification and description of species, conducted by research institutes and universities is only one side of the matter. The work developed by hundreds of NGOs, schools, media, internet, and public bodies is not least important, such as translating into an accessible language and taking the produced knowledge to the great public. This work has been decisively contributing to improve knowledge on the importance and value of the Mata Atlântica biodiversity, as evidences by opinion polls (see Goal A)

In the federal instance, the Rio de Janeiro Botanical Garden Institute, in a partnership with the Chico Mendes Biodiversity Preservation Institute (ICMBio) and the UICN, develops an important work related to species that comprise that Mata Atlântica's flora and fauna, including²:

- evaluation, preservation, and recovery of endangered species;

² UICN, WWF-BRASIL e IPÊ. Metas de Aichi: Situação atual no Brasil. Ronaldo Weigand Jr; Danielle Calandino da Silva; Danielade Oliveira e Silva. Brasília, DF: UICN, WWF-Brasi e IPÊ, 2011. VERIFICAR NUMERO

- preparation and publication of official national lists of endangered species;
- preparation and implementation of national action plans and search for opportunities to develop programs and projects focused on preserving species and areas;
- capacity building and technical training in the UICN methodologies, preparation of guides and manuals;
- exchange of experiences through the conduction of studies and researches;
- preparation of programs to preserve the Brazilian fauna and flora, including the proposal to create the National Program of Preservation of the Flora – PROFLORA;

In addition, the UICN, ICMBio and JBRJ propose to evaluate the status of preservation and categorize the risk of extinction of 10,000 species of the Brazilian fauna, involving all vertebrates and part of the invertebrates, and 40,000 species of the flora between 2011 and 2014.

As an example, it is worth mentioning the following initiatives: Fundação Biodiversitas (Coordinated by the Brazilian Alliance for Zero Extinction-BAZE); Fundação SOS Mata Atlântica (Atlas of the Evolution of Forest Remains and Associated Ecosystems, jointly with the INPE); International Preservation (Biodiversity Hotspots, Critical Ecosystems, Priority Areas for the Preservation of Marine Biodiversity, etc.); National Council of the Mata Atlântica Biosphere Reserve (social-biodiversity chains and Mata Atlântica Market, Mosaics of Protected Areas, Coastal and Marine Preservation); WWF-Brasil (systematic planning of preservation); TNC (Forest Restoration and Payment for Environmental Services); IPÊ (Landscape Planning and Social-Environmental Integration); Northeastern Mata Atlântica Protection Association – AMANE (Urban Forests, participative management of CUs, Plan for



the Handling of Invasive Exotic Species in public CUs in PE); Northeastern Environmental Research Center – CEPAN (Brief on Invasive Exotic Species in the Northeastern State, Altitude Swamps in Pernambuco and Paraíba, Practical Guide for restoration in the northeastern forest zone with high diversity); ISA – Social-Environmental Institute (Indigenous Areas and Quilombos); and SPVS – wildlife research, protection of natural areas for the provision of carbon and biodiversity environmental services in PR.

In the Northeast, the project “Northeastern Mata Atlântica Corridor”, coordinated by the SAVE and with AMANE as its local executive partner, has been articulating since 2010 representatives of six northeast states (BA, SE, AL, PE, PB and RN) to discuss the boundaries of the Northeastern Mata Atlântica Corridor, besides proposing strategies to implement local actions, such as ecological corridors.

In Espírito Santo, the Mata Atlântica Research Institute - IPEMA, issued a publication on the Priority Areas and Actions for the Preservation of the Mata Atlântica Biodiversity and made several studies to subsidize the creation of preservation units in the Espírito Santo state.

Mato Grosso do Sul is developing two initiatives in the knowledge production field: Biota-MS Program and Economic-Ecological Zoning. The Biota-MS Program, created in December 2008 from an agreement with the Superintendence of Science and Technology of Mato Grosso do Sul and the FINEP, has the purpose to build an integrated basis of scientific and technological knowledge and innovation in Mato Grosso do Sul to support the biodiversity management decision-making. (More info at <http://www.biota.ms.gov.br/Iniciativa>)

TRADITIONAL KNOWLEDGE AND BIODIVERSITY

There at least 231 indigenous peoples in Brazil, with a total population estimated in 600 thousand people. The highest concentration is in the Amazon. The Mata Atlântica comprises 120 Indigenous Lands, where approximately 100,000 indigenous of

different ethnies reside. Their contribution to social-biodiversity is impressive. The Brazilian indigenous peoples speak more than 180 languages and dialects and hold a huge and diversified traditional knowledge, the majority of which is not officially documented (BRASIL/MMA, 2010).

In addition to the indigenous, there are hundreds of quilombolas, caçaras, faxinalenses, pomeranes and other communities. As the majority of the indigenous peoples, these communities keep their original traditional knowledge incorporated into their lifestyles, including the use of biodiversity and natural resources (BRASIL/MMA, 2010).

The political representation of indigenous peoples and traditional communities in the process of preparing public policies is a challenge. The huge diversity makes the process complex. Consultations processes are more expensive than in other sectors with a more hierarchical representation. To deal with this complexity, a Federal Decree on July 13, 2003 created the National Committee for the Sustainable Development of Traditional Communities, which provides a communication channel between the federal government and these communities, and “a legitimate forum to protect the interests of this target population” (Decree No. 6.040 of February 7, 2007) (BRASIL/MMA, 2010). The development and approval of the National Policy for the Sustainable Development of Traditional Communities was one of the main results of this Committee.

Policies such as the Pilot Program for the Preservation of Brazilian Tropical Forests (PPG7) supported and strengthened the representing entities. The democracy has been allowing for the organization of their communities and their familiarization with the organization and representation processes. The challenge, when the country is trying to structure itself to eradicate poverty and achieve the growth potential based on its natural resources, is not to lose sight or stop valuing this tradition.

MOBILIZATION OF NATIONAL AND INTERNATIONAL RESOURCES

The international resources to promote the preservation, sustainable use and sharing of the

benefits of biodiversity have been allocated to Brazil through multilateral funds, bilateral cooperation resources, private donations, among others. The most important multilateral funds for biodiversity is the Global Environment Facility (GEF), and the importance of the Lifeweb³ initiative has been growing. A series of UN agencies are dedicated to the matter in Brazil, including the United Nations Development Programme (PNUD), United Nations Environment Programme (PNUMA), the Unesco, among others. A series of national funds and mechanisms has also been acting significantly, such as the Brazilian Biodiversity Fund (Funbio), and the allocation of international resources is starting through the Amazon Fund, managed by the BNDES. "Resources for the environment" comprehend a wide array of actions from sanitation to protected areas. Although, at first sight, biodiversity is a specific issue, when we analyze the targets we find out that it is also related to topics diverse as the control of pollution sources (sanitation), protected areas, traditional knowledge, among others. By expressing the wide increase (including sanitation) of environmental expenses, we are able to see an expansion of all government spheres in the last decade (Table 11).

Although the resources are increasing, they do not grow in the same proportion as the responsibilities. As an example: "the values available to preservation units both in the federal and state budgets have been significantly below the estimated necessary amounts. In 2008, the federal CUs received only

R\$ 316 million of the federal budget. Besides, the rapid expansion of the country's protected area is not being followed by an increase in the budget. For example, from 2001 to 2008 the portion of the budget of the Ministry of the Environment destined to preservation units increased 16.35%, while these areas have grown 78.46% geographically (BRASIL/MMA, 2010).

In the case of the Mata Atlântica, in the last 20 years, one of the most significant sources of resources and technical cooperation has been the German Government, through the German Technical Cooperation Agency (GIZ) and the financial contribution of the KfW Entwicklungsbank, which currently support the Project "Mata Atlântica Protection II", coordinated by the Ministry of the Environment and managed by the Brazilian Biodiversity Fund (Funbio). In addition, the German Government sponsors the subprogram Mata Atlântica PDA, the Ecological Corridor Projects in Bahia and Espírito Santo, and some bilateral projects with Brazilian states.

A state example of resource mobilization is the Project "Preservation of Biodiversity as a Factor of Contribution to the Development of the State of Rio Grande do Sul/Brazil" – Project RS Biodiversity – the product of a donation agreement of the GEF, between the State Secretariat of the Environment and the World Bank, executed in May 2010 and effective in February 2011.

In Paraná, the Secretariat of the Environment (SEMA) coordinates the BIOCLIMA PARANÁ Program, with

3 See <http://www.cbd.int/lifeweb/>

Gastos Ambientais por Entes Federados e sua Evolução			
ANO	Gastos Ambientais Federais*	Gastos Ambientais Estaduais - A*	Gastos Ambientais Municipais - A*
2000	2.595.989	2.068.137	453.808
2001	4.057.069	1.899.106	371.085
2002	2.049.708	6.715.498	4.075.746
2003	1.406.690	5.488.952	5.682.135
2004	1.583.045	5.079.516	4.906.301
2005	2.554.986	5.558.193	4.469.773
2006	1.838.812	6.163.383	6.357.657
2007	5.155.115	5.118.493	7.536.393
2008	5.420.525	6.463.239	8.187.035

* Valores Constantes 2008 (IGP-DI) em R\$ 1.000,00 Fonte: MERICO (2009), partir de IBGE (IDS, 2008), MF/STN Contas Consolidadas da União (2009)

Table 11 Environmental expenditures by federated entities and their evolution

the purpose to preserve and recover biodiversity by promoting mitigation and adaptation in view of climate changes, contributing to improve the quality of life of the population. This program establishes activities in action plans divided into the following projects: 1) Preservation of Biodiversity; 2) Recovery of Biodiversity; 3) Economic Incentives for Preservation; 4) Mitigation and Adaptation in view of Climate Changes; 5) Environmental Education and Training; 6) Research; 7) Monitoring and Inspection. The program provides for a series of innovative measures such as the BIOCREDIT and the Payment for Environmental Services, submitted as a State Law. As a result of the effort and involvement of different sectors to build the Program, with emphasis on new governance models through public and private funds (BIOCREDIT), an intersectorial alliance network is being built in Paraná to support the BIOCLIMA PARANÁ. In the state of Espírito Santo, o BANDES SUSTENTÁVEL, is a facility of the state bank to support investments on implantation, expansion, relocating, modernization, diversification, technological and managerial development, which, for instance, provide for the reduction of the Green House Gases emissions in the environment and seeks for better practices of environmental control

MATA ATLÂNTICA RESTORATION FUND

The Restoration Fund of the Mata Atlântica Biome was instituted by article 36 of Law No. 11.428, of December 22, 2006, but is still pending regulation. This is an important instrument to implement the policies of preservation and recovery of the Mata Atlântica. The Ministry of the Environment hired a study on the importance of the fund and a draft regulation from Mr. Paulo Haddad, former Minister of Finance. The draft Decree, currently being negotiated between the MMA and the Chief of Staff, proposes that the Restoration Fund of the Mata Atlântica Biome have an accounting and financial and that its resources are invested in two modes: a) reimbursable and b) non-reimbursable. The draft Decree further proposes that Banco do Brasil be the financial and executive agent and that the Fundo have a Resolution Council with the participation of government and non government bodies.

NATIONAL PROGRAM FOR THE PRESERVATION AND RECOVERY OF THE MATA ATLÂNTICA

The National Program for the Preservation and Recovery of the Mata Atlântica – PMA is another extremely important instrument of implementation that has been completed for years and still has not been officially implemented by the Ministry of the Environment. The Program, prepared in collaboration with the Mata Atlântica NGO Network and other civil society organizations, seeks to coordinate federal policies of the Mata Atlântica. According to the proposal, the program will be executed in a partnership by the Federal Government, state governments, municipalities and entities of the organized civil society. The main purpose of the PMA is to reestablish at least one third of the original native vegetation of the Mata Atlântica, and therefore ensure the environmental services it provides to the country, such as the maintenance of its extraordinary biodiversity, as well as ensure water supply and carbon fixation and consequently mitigate of climate changes, as well as reduce rural poverty. The Mata Atlântica intends to contribute to three great goals of the Brazilian environmental policy: a) preservation of biodiversity in situ; b) mitigation of climate changes; and c) reduction of rural poverty.

To achieve these goals, the PMA is estimated to last for 10 years with the following themes and mainstreaming issues:

- 1) Consolidation of the Preservation Units System;
- 2) Recovery of altered areas and payment for environmental services;
- 3) Sustainable use of non-wood natural resources;
- 4) Environmental monitoring, inspection, and fire fighting and prevention;
- 5) Institutional strengthening;
- 6) Management of the Program and financial arrangements;

MUNICIPAL PLANS FOR THE PRESERVATION AND RECOVERY OF MATA ATLÂNTICA

As to the Mata Atlântica, Law 11.428/06 also instituted the Municipal Plans for the Preservation and Recovery of Mata Atlântica, to be prepared and implemented in each of the approximately 3,500 municipalities in the region. The Municipal Plans

have an innovative and very important aspect that is the municipalization of the discussion regarding the protection and recovery of the Mata Atlântica, especially concerning the preservation and recovery of the Legal Reserve (RL), Permanent Preservation Areas (APPs) and the creation and implementation municipal Preservation Units (CUs) and other proactive actions in the Municipalities. These plans could be prepared through partnerships that involve the local authorities, civil society organizations and academic institutions, upon the approval of the Municipal Environment Councils. In this sense, o Municipal Plan for the Preservation and Recovery of Mata Atlântica is another effective instrument to achieve the CBD goal, since if it is executed according to the Law it will ensure the participative planning and implementation, as well as capacity building and knowledge management by the citizens.

The minimum requirements to prepare the Municipal Plans are set forth in Decree No. 6660/08. The priorities for the preservation and recovery of the native vegetation and biodiversity defined in the Municipal Plan intend to serve as basis for the implementation of public policies, programs, projects and activities under the responsibility of the municipality. Although the Law was enacted in 2006, until 2012, out of the 3,500 municipalities fully or partially inserted in the Mata Atlântica, only João Pessoa (PB) and Maringá (PR) have prepared and approved their Municipal Plans. The MMA, with the technical and financial cooperation of the German Government and Funbio, is developing four regional projects of mobilization and training of city governments to prepare the Municipal Plans of the Mata Atlântica and seven pilot projects of demonstrative preparation of Municipal Plans of the Mata Atlântica, contemplating municipalities in the South, Mid-West, Southeast and Northeast regions. These pilot projects are part of a process to build knowledge on the preparation and implementation of the Municipal Plans of the Mata Atlântica. This methodology will be made available until the end of 2012 by the Ministry of the Environment to all municipalities in the region as a methodology script and a practical manual for the preparation and implementation of the Municipal Plans of the Mata Atlântica.



CONCLUSIONS AND RECOMMENDATIONS

It is fundamental to include matters related to the protection, preservation, recovery, and sustainable use of biodiversity in the different spheres of the government and public policies. Without them, it becomes difficult to effectively advance towards sustainable development. To achieve this inclusion or mainstreaming of these matters to the several public bodies and levels, as well as the many industries of the economy, it is necessary to have political knowledge, planning, and will, in addition to the indispensable legal and financial instruments.

Regarding the Mata Atlântica, as seen in Goal C, the legal instruments already exist, but face serious danger of setbacks. As mentioned in Goal A, the population is informed on the importance and urgency of environmental matters and is willing to do their share. However, a remaining problem is the lack of political will and insufficiency of the implementation frameworks, and the federal and state bodies lack staff and structure. As to the municipalities, the issue is more serious, since the absolute majority has neither an Environment Council nor a technical body to locally execute environmental policies.

The worst problem, however, is that after decades of systematic progresses to improve the environmental rules, in the last years there have been countless legislation initiatives, that try to weaken or even revoke rules that took so much effort to conquer, with the under the Executive's approval. The most emblematic example is the Forest Code, where the two houses of the National Congress approved completely different and contradictory wordings and eventually that of the Deputies' Chamber prevailed. In the specific case of the Mata Atlântica, the Bill of Law No. 2.441/07 is being discussed in the Deputies' Chamber, with the purpose to modify the Mata Atlântica Law (11.428/06), having just been rejected by the Chamber's Environment Committee, making way for the suppression of primary vegetation and wood exploration, including endangered species, in the entire Mata Atlântica. On March 28, 2012, by virtue of the mobilization of NGOs, the Government and the environmentalist group of the Deputies' Chamber, the Chamber's Environment and Sustainable Development Committee reject the replacement submitted by Deputy Irajá Abreu. The ruralists intend to appeal the decision before the Constitution and Justice Committee in the Chamber's Plenary Session. This proves that the society must continue to mobilize.

Another initiative of serious setback being discussed in the Congress is the Bill of Constitutional Amendment (PEC 215), approved in the Constitution and Justice Committee of the Deputies' Chamber in March 2012, which intends to transfer to the legislative (today a prerogative of the Executive) the delimitation of indigenous lands and also the recognition of quilombola lands and the creation of preservation units.

All of these initiatives arise from the so-called "Ruralist Group" and seeks to reset the legislation in order to grant amnesty to depredators, forgive penalties for environmental crimes, and allow new deforestations, in addition to obstruct the creation of preservation units and the recognition and delimitation of indigenous and quilombola lands. That is, if any of these initiatives is successful concerning the Mata Atlântica, it will not only bring difficulties but fully jeopardize the compliance with the CBD Targets for 2020.

As regards the acknowledgment of the importance and value of biodiversity, it can be said that in the Mata Atlântica there is already a good level of studies and researches





and countless initiatives in progress, both in the public sectors and in the NGOs, academic institutions and also private initiative. This is already reflected in the general perception of the society on biodiversity and the importance of the environment, as seen in Goal A. It is clear that new investments and initiatives must be made to improve this knowledge.

As to the Action Plans, there are already important initiatives in the federal level such as the map "Priority Areas for the Preservation, Sustainable Use and Sharing of Benefits Arising from the Brazilian Biodiversity" acknowledged by Decree 5.092/2004, the National Development Agenda (AND), the National Plan for the Promotion of Social-Biodiversity Product Chains (PNPSB) and the National Biodiversity Strategy and Action Plan for the 2020 Aichi Targets, currently being prepared.

In the specific case of the Mata Atlântica there is an important instrument, prepared with broad participation but still not institutionalized, called the National Program for the Preservation and Recovery of the Mata Atlântica- PMA, currently under review by the Ministry of the Environment. Another indispensable instrument is the Fund for the Restoration of the Mata Atlântica Biome, instituted by article 36 of Law No. 11.428/2006, but still not regulated. The proposal of Decree is also pending a government decision. The Fund is essential for the implementation of the PMA and also to support the municipalities to prepare and implement the Municipal Plans for the Preservation and Recovery of the Mata Atlântica, also created through Law 11.428/2006.

Another major setback initiative underway in Congress is the Draft Constitutional Amendment (PEC 215), approved by the Committee on Constitution and Justice of the House of Representatives in March 2012, that want to transfer to the legislature (now a prerogative of the executive) the demarcation indigenous lands and also the recognition of quilombolas lands and the creation of maroon conservation units.

In the scope of the states, there are different levels of implementation and instruments. Some states such as São Paulo already prepare action plans for the CBD targets, while others have not even considered this. Many states already have their laws of Ecological ICMS and Payment for Environmental Services, but nearly all of them lack staff and resource structure.

It is advisable that both the states (those who still have not done so) and the municipalities prepare their state and municipal plans regarding the CBD in collaboration.

As to the municipalities in the Mata Atlântica it is advisable that when preparing the Municipal Plans for the Preservation and Recovery of the Mata Atlântica the CBD targets are taken into account, and actions and activities are established for their achievement.







WWW.RBMA.ORG.BR

REFERÊNCIAS

BIBLIOGRAPHY

AB`SABER, A. N. **Litoral do Brasil. Metalivros**, São Paulo, 2001.

ALBUQUERQUE, J. L.; LINO, C. F.; DIAS, M. **Mosaicos de Unidades de Conservação no Corredor da Serra do Mar**. São Paulo: Conselho Nacional da Reserva da Biosfera da Mata Atlântica, 2007.

ALMEIDA, L.; CASTELO-BRANCO, B.P.; MELO, M.D.V.C. **CADASTRO DAS UNIDADES DE CONSERVAÇÃO. IN: SABERES E FAZERES DA MATA ATLÂNTICA DO NORDESTE: TECENDO UMA REDE DE GESTORES**. AMANE. RECIFE- PE, 69-92P, 2012.

ARAÚJO. M.A.R. **Unidades de conservação no Brasil: a história de um povo em busca do desenvolvimento e da proteção da natureza**. In: Unidades de Conservação no Brasil: da república à gestão de classe mundial. Belo Horizonte: Segrac, 2007.

BECHARA, F.C. **Restauração ecológica de restingas contaminadas por Pinus no Parque Florestal do Rio Vermelho, Florianópolis, SC**. Dissertação de Mestrado. Universidade Federal de Santa Catarina. Florianópolis, 125p, 2003.

BRASIL/CDES. **Agenda Nacional de Desenvolvimento - AND**. Brasília (DF): Presidência da República, Conselho de Desenvolvimento Econômico e Social – CDES, 2007.

BRASIL/MAPA. **Plano Setorial de Mitigação e de Adaptação às Mudanças Climáticas Visando à Consolidação de uma Economia de Baixa Emissão de Carbono na Agricultura/ Programa de Agricultura de Baixa Emissão de Carbono/ Programa ABC**. Brasília (DF) (versão preliminar elaborada pelo Ministério da Agricultura, Pecuária e Abastecimento). Ministério da Agricultura, Pecuária e Abastecimento (MAPA), 2010.

BRASIL/MMA. **Quarto Relatório Nacional para a Convenção sobre Diversidade Biológica: Brasil**. Brasília (DF): Ministério do Meio Ambiente/ Diretoria do Programa Nacional de Conservação da Biodiversidade - DCBio, 2010.

BRASIL. MMA. **Programa REVIZEE: avaliação do potencial sustentável dos recursos vivos na zona econômica exclusiva: relatório executivo**. MMA. Brasília. 280p.,2006.

CÂMARA. GUSMÃO.I. GALINDO-LEAL.C. **Mata Atlântica – Biodiversidade, Ameaças e Perspectivas**. São Paulo: Fundação SOS Mata Atlântica/Conservação Internacional, 2005.

CAMPANILI, M. PROCHNOW. M. **Mata Atlântica – Uma Rede pela Floresta**. Brasília: Rede de ONGs da Mata Atlântica, 2006.

CAMPANILI, M.; BETO.R. **Almanaque Brasil Socioambiental 2008**. São Paulo: Instituto Socioambiental, 2007.

CAMPANILI, M.; Schaffer, W. B. **Mata Atlântica: Patrimônio Nacional dos Brasileiros. Biodiversidade** 34, MMA, Brasília, 2010.

CAMPANILI, M.; Schaffer, W. B. **Mata Atlântica: manual de adequação ambiental. Biodiversidade**, 35, Brasília: MMA/SBF, 2010

CAPOBIANCO, J.P. **Dossiê Mata Atlântica 2001**. São Paulo: Instituto Socioambiental, Rede de ONGs da Mata Atlântica e Sociedade Nordestina de Ecologia, 2001.

CAPOBIANCO, J.P. **Mata Atlântica: conceito, abrangência e área original. In: A Mata Atlântica e você: como preservar, recuperar e se beneficiar da mais ameaçada floresta brasileira**. Org: Wigold B. Schäffer e Miriam Prochnow. Brasília: Apremavi.



156 p.,2002.

DEAN, Warren. **A Ferro e Fogo – A História e a Devastação da Mata Atlântica Brasileira**. São Paulo: Cia das Letras, 1996.

DIAS, M.H; LINO, C.F. **Águas e Florestas da Mata Atlântica: Por uma Gestão Integrada**. São Paulo: Conselho Nacional da Reserva da Biosfera da Mata Atlântica/Fundação SOS Mata Atlântica, 2003.

DIAS, M.H. [et al.]. **Conservação costeira e marinha e ordenamento pesqueiro** – São Paulo: Conselho Nacional da Reserva da Biosfera da Mata Atlântica, (Cadernos da Reserva da Biosfera da Mata Atlântica. Série 1: Conservação e áreas protegidas,40), 32p.,2010.

Fundação SOS Mata Atlântica, INPE e ISA. **Atlas da evolução dos remanescentes florestais e ecossistemas associados no domínio da Mata Atlântica no período 1990-1995**. São Paulo: Fundação SOS Mata Atlântica, Instituto Nacional de Pesquisas Espaciais e Instituto Socioambiental, 1998.

Galindo-Leal, C. & Câmara, I. **Status do hotspot Mata Atlântica: uma síntese. In: Mata Atlântica: biodiversidade, ameaças e perspectivas**. São Paulo: Fundação SOS Mata Atlântica – Belo Horizonte: Conservação Internacional. 472 p.,2005.

GANEM, R. S. **Gestão Integrada da Biodiversidade: corredores, mosaicos e reservas da biosfera. Conservação da Biodiversidade: legislação e políticas públicas**. Brasília (DF): Câmara dos Deputados. p. 384-414, 2010.

ESPINHA.A.M.L. [et al.]. **Gestão sustentável e qualificação profissional em meios de hospedagem: Estudo de caso Paraty/Rio de Janeiro** – São Paulo: Conselho Nacional da Reserva

da Biosfera da Mata Atlântica, (Cadernos da Reserva da Biosfera da Mata Atlântica. Série 4: Políticas Públicas; 39), 33p.,2010.

GONÇALVES . **Informações sobre a situação da gestão das UCs estaduais no bioma Mata Atlântica: Avaliação do potencial de manejo efetivo das áreas protegidas do bioma Mata Atlântica (relatório complementar para TNC)**. Não publicado. 28 p.,2008.

KRONKA, F. J.N. **Inventário Florestal da Vegetação Natural do Estado de São Paulo**. São Paulo: Secretaria do Meio Ambiente/Instituto Florestal, Imprensa Oficial, 2005.

LIMA, André. **Aspectos Jurídicos da Proteção da Mata Atlântica**, São Paulo: ISA, 2001.

LINO,C.F. [et al.]. **Conservação da Diversidade Biológica- CDB: Metas de Aichi 2020: protocolo de Nagoya (acesso e repartição de benefícios do uso de recursos naturais)-** São Paulo: Conselho Nacional da Reserva da Biosfera da Mata Atlântica. (Cadernos da Reserva da Biosfera da Mata Atlântica. Série1: Conservação e áreas protegidas; 41), 64p.,2011.

LINO,C.F. [et al.]. **Mosaico de Unidades de Conservação do Jacupiranga** – São Paulo: Conselho Nacional da Reserva da Biosfera da Mata Atlântica. (Caderno da Reserva da Biosfera da Mata Atlântica.Série 1 Conservação e Áreas Protegidas; 34), 2009.

LINO,CF. [et al.]. **Mosaicos de Unidades de Conservação no Corredor da Serra do Mar-** São Paulo: Conselho Nacional da Reserva da Biosfera da Mata Atlântica. (Caderno da Reserva da Biosfera da Mata Atlântica. Série 1 Conservação de Áreas Protegidas; 32), 2007.

REFERENCES

BIBLIOGRAPHY

LEWINSOHN, T. M. **Avaliação do estado do conhecimento da biodiversidade brasileira** - volumes I e II. - Brasília: MMA, 520 p.,2005. MBG W3 Trópicos – Disponível em: < <http://www.tropicos.org/>> Acesso em: 25 jun. 2008.

LINO, C.F. **Reservas da biosfera, sítios do patrimônio natural, sítios Ramsar e outras. Seminário Ano Internacional da Biodiversidade. Anais...** Brasília (DF): Câmara dos Deputados, 2010.

MEDEIROS, J. D. **A Biotecnologia e a extinção de espécies.** Revista Biotecnologia, Ciência e Desenvolvimento, v. 30, p. 109-113, 2003.

MEDEIROS, R;YOUNG,C.E.F; PAVESE,H.B; ARAÚJO, F.F.S. **Contribuição das unidades de conservação brasileiras para a economia nacional.** Editores – Brasília: UNEP-WCMC, 2011.

LINO, C.F. SIMÕES, L. L. **Metas 2010 da CDB para o Bioma Mata Atlântica: RBMA,** 2010. <http://www.rbma.org.br/anuario/pdf/cdb2010.pdf>

MEDEIROS, J.D.**Campo dos Padres. In: Juan Rivas Beasley. Serra Catarinense: as montanhas do sul do Brasil.** Letras Brasileiras, Florianópolis, 2005.

MEDEIROS, R;YOUNG, C. E. F; PAVESE, H. B.; ARAÚJO, F. F. S. **Contribuição das Unidades de Conservação para a Economia Nacional:** Editores. UNEP-WCMC, 2011.

MERICO, L. F. K. **Gastos Públicos Ambientais no Brasil.** Brasília (DF): CEPAL, 2009.

MMA. **Mapa de Unidades de Conservação e Terras Indígenas na Área de Aplicação da Lei da Mata Atlântica.** Org. Fatima Becker Guedes, Helen Gurgel, André A. Cunha, Wigold B. Schaffer, 2011

MMA. **Panorama da Conservação dos ecossistemas costeiros e marinhos no Brasil.**

Secretaria de Biodiversidade e Florestas/Gerência de Biodiversidade Aquática e Recursos Pesqueiros. Brasília: MMA/SBF/GBA. 148 p.,2010.

MMA. **Pagamentos por Serviços Ambientais na Mata Atlântica: lições aprendidas e desafios.** Org: Fátima Becker Guedes e Susan Edda Seehusen. Brasília: MMA. 272 p.,2011

MELO, T. **Sementes do Diálogo – Registros da Primeira Fase do Diálogo Florestal para a Mata Atlântica 2005-2007.** Rio de Janeiro: Instituto Bioatlântica, 2008.

MERCADANTE, M. **Uma década de debate e negociação: a história da elaboração da Lei do Snuc. In: Direito ambiental das áreas protegidas: o regime jurídico das unidades de conservação.** Coordenação: Antonio Herman Benjamin – Rio de Janeiro: Forense Universitária. 548 p., 2001.

MITTERMEIER, R.A.;GIL, P.R.;HOFFMANN, M.;PILGRIM, J.; BROOKS, T.; MITTERMEIER, C.G.; LAMOUREX, J. & FONSECA, G.A.B. **Hotspots Revisited. Earth's Biologically Richest and Most Endangered Terrestrial Ecoregions.** Cemex, Washington, DC., 2004.

MYERS, N.; MITTERMEIER, R.A.; MITTERMEIER, C.G.; FONSECA, G.A.B.; KENT, J. **Biodiversity hotspots for conservation priorities.** Nature 403: 853-858.,2000.

NOFFS, P. S.; GALLI, L.F.; GONÇALVES, J.C. **Recuperação de Áreas Degradadas da Mata Atlântica: Uma experiência da Companhia Energética de São Paulo.** Série Cadernos da Reserva da Biosfera da Mata Atlântica (2ª edição). São Paulo: Conselho Nacional da Reserva da Biosfera da Mata Atlântica, Secretaria de Estado do Meio Ambiente do Estado de São Paulo, CETESB - Companhia Estadual de Tecnologia de Saneamento Ambiental e CESP, Brasília: MMA. 48 p.,2000.



OLIVEIRA, P. P.; RAMBALDI, D. M. **Pequenas e Poderosas – ONGs ambientalistas do Corredor de Biodiversidade da Serra do Mar**. Rio de Janeiro: Conservação Internacional, 2007.

Pacto pela restauração da mata atlântica: **Protocolo de monitoramento para programas/projetos de restauração florestal, 2011**. Disponível em: http://www.pactomataatlantica.org.br/pdf/_protocolo_projetos_restauracao.pdf.

PÁDUA, J.A. **Natureza e Projeto Nacional: nascimento do ambientalismo brasileiro (1820-1920)**. In: **Ambientalismo no Brasil: Passado, presente e futuro**. Org: E. Svirsky e J.P. Capobianco – São Paulo: Instituto Socioambiental e Secretaria do Meio Ambiente do Estado de São Paulo. 112 p.,1997.

PÁDUA, J.A. **Um sopro de destruição: pensamento político e crítica ambiental no Brasil escravista (1786-1888)**. Rio de Janeiro: Jorge Zahar Editor.,2002.
PINHEIRO, M.R (Org.) **Recomendações para reconhecimento e implementação de mosaicos de áreas protegidas**. Brasília, DF,GTZ. 82p.;il. color.:22cm, 2010.

STEHMANN, E.J.R.[et al] **Plantas da Floresta Atlântica** - Rio de Janeiro: Jardim Botânico do Rio de Janeiro, 516p.,2009

PRATES, A. P. L. **Recifes de Coral e Unidades de Conservação Costeiras e Marinhas no Brasil: uma análise da representatividade e eficiência na conservação da biodiversidade**. Brasília (DF): Universidade de Brasília, 2003.

PREISKORN, G. M.; PIMENTA, D.; AMAZONAS, N. T.; NAVE, A. G.; GANDOLFI, S.; RODRIGUES, R.R.; BELLOTTO, A.; CUNHA, M.C.S. **Metodologia de Restauração para Fins de Aproveitamento Econômico (Reserva Legal e Áreas Agrícolas)**. In: Ricardo Ribeiro Rodrigues et al. **Pacto pela Restauração da Mata Atlântica: referencial dos**

conceitos e ações de restauração florestal. LERF/ESALQ, Instituto BioAtlantica, São Paulo., 2009.

PROCHNOW, M. **Barra Grande – A hidrelétrica que não viu a floresta**. Santa Catarina: Apremavi, 2005.

PROCHNOW, M. **Matas Legais – Planejando Propriedades e Paisagens**. Santa Catarina: Apremavi, 2008.

REIS, L. V. S. **Cobertura florestal e custo de tratamento de águas em bacias hidrográficas de abastecimento público: caso do manancial do município de Piracicaba** (Tese de Doutorado). Piracicaba: Escola Superior de Agricultura Luiz de Queiroz. 215p.,2004.

RIBEIRO, H. **Minha Terra Protegida – Histórias das RPPNs da Mata Atlântica**. São Paulo: Fundação SOS Mata Atlântica/Conservação Internacional, 2007.

RODRIGUES, R.; BRANCALION, P. H.; ISERNHAGEN, I. **Pacto pela restauração da Mata Atlântica: referencial dos conceitos e ações de restauração florestal**. São Paulo: LERF/Esalq, 2009.

RYLANDS, A.B.; FONSECA, G.A.B.; LEITE, Y.L.R.; MITTERMEIER, R.A. **Primates of the Atlantic Forest – origin, distributions, endemism, and communities**. In: M.A. Norconk, A.L. Rosenberger and P.A. Garber (eds.). **Adaptive Radiations of Neotropical Primates**. Plenum Press. New York. pp. 21-51.,1996.

SCHÄFFER, W. PROCHNOW, M. **A Mata Atlântica e Você – Como preservar, recuperar e se beneficiar da mais ameaçada floresta brasileira**. Brasília: Apremavi, 2002.

SCHAFFER, W. B.; ROSA, M.R.; AQUINO, L.C.S. de; MEDEIROS, J.D. **Áreas de Preservação Permanente e Unidades de Conservação & Áreas de Risco. O que uma coisa tem a ver com a outra?** *Biodiversidade* 41, MMA, Brasília, 2011.

REFERENCES

BIBLIOGRAPHY

SECRETARIADO DA CONVENÇÃO SOBRE DIVERSIDADE BIOLÓGICA. **Panorama da Biodiversidade Global 3**. Brasília (DF): Ministério do Meio Ambiente/ Secretaria de Biodiversidade e Florestas, 2010.

TEIXEIRA, I. M. V. **Papel articulador: depoimento**. 2010.

THOMAS, C. D. CAMERON, A. GREEN, R. E. et al. **Extinction risk from climate change**. Nature, v. 427, n. 6970, p. 145-148, 8 de jan de 2004.

UICN, WWF-Brasil e Ipê. **Biodiversidade brasileira: análise de situação e oportunidades. Documento-base**. Brasília, UICN, WWF-Brasil e Ipê. 72 p.,2011.

URBAN, T. **Saudade do Matão: Relembrando a História da Conservação da Natureza no Brasil**. Curitiba: Editora da UFPR, 1998.

VIANNA, L.F.N.; SOUZA, J.M. **Relatório sobre o levantamento dos deslizamentos ocasionados pelas chuvas de novembro de 2008 no complexo do Morro do Baú, municípios de Ilhota, Gaspar e Luiz Alves**. Centro de Informações de Recursos Ambientais e de Hidrometeorologia de Santa Catarina. Empresa de Pesquisa Agropecuária e Extensão Rural de Santa Catarina S.A., Florianópolis, 2009.

WEIGAND Jr.; SILVA.R.; CALANDINO.D.; SILVA.O.D. **Metas de Aichi: Situação atual no Brasil**: Brasília, DF: UICN, WWF-Brasi e IPÊ, 2011.

WILSON, E. O. **Futuro da Vida: Um estudo da biosfera para a proteção de todas as espécies, inclusive a humana**. Editora Campus, Rio de Janeiro,2002.

ZILLER, S. R. **A Estepe gramíneo-lenhosa no segundo planalto do Paraná: diagnóstico ambiental com enfoque à contaminação biológica**. Tese de Doutorado. Universidade Federal do Paraná. Curitiba, 268 p.,2000.

SITES

CONAB. **Conab - Companhia Nacional de Abastecimento: Plano Nacional de Promoção das Cadeias de Produtos da Sociobiodiversidade - PNPSB**. Disponível em: <<http://www.conab.gov.br/conteudos.php?a=1341&t=2>>.

Histórico do Código Florestal - <http://www.sosflorestas.com.br/historico.php>

Histórico no Brasil - ICMS ecológico. Disponível em: <http://www.icmsecologico.org.br/index.php?option=com_content&view=article&id=52&Itemid=82>. Acesso em: 16 de jul. de 2011.

SECRETARIADO DA CONVENÇÃO SOBRE DIVERSIDADE BIOLÓGICA. **Key Elements of the Strategic Plan 2011-2020, including Aichi Biodiversity Targets**. Disponível em: <<http://www.cbd.int/sp/elements/>>. Acesso em: 29 de jun. de 2011.

SPAROVEK, G. BARRETTO, A. KLUG, I.; BERNDDES, G. **Considerações sobre o Código Florestal brasileiro. 2011**. Disponível em: <http://www.imaflora.org/upload/repositorio/gerdspavorek_CF_junho.pdf>.

TERRA DE DIREITOS. **Boletim de avaliação e monitoramento do Programa Nacional de Agrobiodiversidade**. Disponível em: <<http://terradedireitos.org.br/wp-content/uploads/2011/04/Programa-Nacional-de-Conserva%C3%A7%C3%A3o-da-Agrobiodiversidade-INTERNET-1.pdf>>, 2011

VOX-POPULI; ISER; MMA. **O que os brasileiros pensam sobre a biodiversidade**. Apresentação PowerPoint. Disponível em: <<http://www.wwf.org.br/informacoes/biblioteca/?3640>>. Acesso em: 24 de jun. de 2011. 2006.



TABLE OF ACRONYMS

ADI - Ação Direta de Inconstitucionalidade	FATMA - Fundação do Meio Ambiente
AGEVAP – Agência da Bacia do Rio Paraíba do Sul	FBC - Fundação Brasil Cidadão
AMANE - Associação para Proteção da Mata Atlântica do Nordeste	FINEP - Financiadora de Estudos e Projetos
AND - Agenda Nacional de Desenvolvimento	FSC - Forest Stewardship Council
ANP - Agência Nacional do Petróleo, Gás Natural e Biocombustíveis	FUNBIO - Funbio - Fundo Brasileiro para a Biodiversidade
APA - Área de Proteção Ambiental	FUNCATE - Fundação de Ciência, Aplicações e Tecnologia Espaciais
APEMB - Associação dos Produtores Ecológicos do Maciço de Baturité	FURB - Universidade Regional de Blumenau
APP - Área de Preservação Permanente	Gambá - Grupo Ambientalista da Bahia
Apremavi - Associação de Preservação do Meio Ambiente e da Vida	GEE - Gases de efeito estufa
BMU - Ministério do Meio Ambiente, da Proteção da Natureza e Segurança Nuclear da República Federal da Alemanha	GEF - Global Environment Fund
BNDES - Banco Nacional de Desenvolvimento Econômico e Social	GIZ - Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
CAT - Grupo Conexão Abrolhos-Trindade	GSPC - The Global Strategy for Plant Conservation
CDB - Convenção sobre Diversidade Biológica	IBAMA - Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis
CDES - Conselho de Desenvolvimento Econômico e Social	IBDF - Instituto Brasileiro de Desenvolvimento Florestal
Cepan - Centro de Pesquisas Ambientais do Nordeste	IBGE - Instituto Brasileiro de Geografia e Estatística
CEPEMA - Centro de Capacitação e Pesquisa em Meio Ambiente da Universidade de São Paulo	IBOPE - Instituto Brasileiro de Opinião Pública e Estatística
CEPLAC - Comissão Executiva do Plano da Lavoura Cacaueira	ICMBio - Instituto Chico Mendes de Conservação da Biodiversidade
CERFLOR - Certificação Florestal	ICMS - Imposto sobre Circulação de Mercadorias e Serviços
CGEN - Conselho de Gestão do Patrimônio Genético	IDH - Índice de Desenvolvimento Humano
CI-Brasil - Conservação Internacional Brasil	IDPA - Índice de Desempenho de Política Pública de Meio Ambiente
CNBB - Conferência Nacional dos Bispos do Brasil	IEMA - Instituto Estadual de Meio Ambiente
CNI - Confederação Nacional da Indústria	Imazon - Instituto do Homem e Meio Ambiente da Amazônia
CNUC - Cadastro Nacional de Unidades de Conservação	INCAPER - Instituto Capixaba de Pesquisa, Assistência Técnica e Extensão Rural
CONAB - Companhia Nacional de Abastecimento	INPE - Instituto Nacional de Pesquisas Espaciais
CONABIO - Comissão Nacional de Biodiversidade	IPAM - Instituto de Pesquisa Ambiental da Amazônia
CONAMA - Conselho Nacional do Meio Ambiente	IPÊ - Instituto de Pesquisas Ecológicas
CONCAFÉ - Cooperativa dos Cafeicultores Ecológico	IPEMA - Instituto de Pesquisas da Mata Atlântica
COP - Convention of the Parties	ISA - Instituto Socioambiental
COPAM - Conselho Estadual de Política Ambiental	ISER - Instituto de Estudos da Religião
CSR - Centro de Sensoriamento Remoto	ITPA - Instituto Terra de Preservação Ambiental
CUT - Central Única dos Trabalhadores	JBRJ - Jardim Botânico do Rio de Janeiro
EMBRAPA - Empresa Brasileira de Pesquisa Agropecuária	KfW - Kreditanstalt fuer Wiederaufbau
EPAGRI - Empresa de Pesquisa Agropecuária e Extensão Rural de Santa Catarina	M.N.E. - Monumento Natural Estadual
	MAPA - Ministério da Agricultura, Pecuária

e Abastecimento

MCT - Ministério da Ciência, Tecnologia e Inovação

MDA - Ministério de Desenvolvimento Agrário

MDIC - Ministério do Desenvolvimento, Indústria e Comércio Exterior

MDS - Ministério do Desenvolvimento Social e Combate à Fome

MMA - Ministério do Meio Ambiente

MME - Ministério de Minas e Energia

MONA - Monumento Natural

MP - Medida Provisória

MPOG - Ministério do Planejamento, Orçamento e Gestão

OAB - Ordem dos Advogados do Brasil

ONG - Organização Não Governamental

P.E. - Parque Estadual

PARNA - Parque Nacional

PARNAM - Parque Nacional Marinho

PDA - Subprograma Projetos Demonstrativos

PEC - Projeto de Emenda Constitucional

PGPM - Política de Garantia de Preços Mínimos

PIB - Produto Interno Bruto

PL - Projeto de Lei

PMA - "Programa Nacional de Conservação e Recuperação da Mata Atlântica – Programa Mata Atlântica "

PNAP - Programa Nacional de Formação em Administração Pública

PNB - Política Nacional de Biodiversidade

PNMC - Política Nacional de Mudanças Climáticas

PNPSB - Plano Nacional de Promoção das Cadeias de Produtos da Sociobiodiversidade

PNUD - Programa das Nações Unidas para o Desenvolvimento

PNUMA - Programa das Nações Unidas para o Meio Ambiente

PPBIO - Programa de Pesquisa em Biodiversidade

PPG7 - Programa Piloto para Proteção das Florestas Tropicais do Brasil

PROBIO - Projeto de Conservação e Utilização Sustentável da Diversidade Biológica Brasileira

PROFLORA - Programa de Plantio Comercial e Recuperação de Florestas

Promata - Projeto de Proteção da Mata Atlântica em Minas Gerais

PSA - Pagamentos por Serviços Ambientais

RBMA - Reserva da Biosfera da Mata Atlântica

RDS - Reserva de Desenvolvimento Sustentável

REAPI - Rede Ambiental do Piauí

REBIO - Reserva Biológica

RENTAS - Rede Nacional de Combate ao Tráfico de Animais Silvestres

RESEX - Reserva Extrativista

REVIS e/ou **RVS** - Refúgio de Vida Silvestre

REVIZEE - Programa de Avaliação do Potencial Sustentável dos Recursos Vivos da Zona Econômica Exclusiva Brasileira

RL - Reserva Legal

RPPN - Reserva Particular do Patrimônio Natural

SAVE - Sociedade para a Conservação das Aves do Brasil

SEAPA - Secretaria de Estado de Agricultura, Pecuária e Abastecimento de Minas Gerais

SEBRAE - Serviço Brasileiro de Apoio às Micro e Pequenas Empresas

SEMA - Secretaria Especial de Meio Ambiente

Sisnama - Sistema Nacional do Meio Ambiente

SLIMF - Small and Low Intensity Managed Forests

SNUC - Sistema Nacional de Unidades de Conservação da Natureza

SPVS - Sociedade de Pesquisa em Vida Selvagem e Educação Ambiental

TNC - The Nature Conservancy

UC - Unidade de Conservação

UFMG - Universidade Federal de Minas Gerais

UFSC - Universidade Federal de Santa Catarina

UFV - Universidade Federal de Viçosa

UICN - International Union for Conservation of Nature

WWF - World Wide Fund for Nature





The "MATA ATLÂNTICA YEARBOOK"
is a permanent program of the Mata
Atlântica Biosphere Reserve in
order to consolidate, update and
provide information about the Mata
Atrlântica biome systematically and
periodically, aiming to facilitate
comparisons (annual and
multiannual) on advances and
challenges of conservation,
scientific and traditional knowledge
and sustainable development in the
Atlantic Forest.

Execution:



Sponsor:



Support:

