

# What on earth ? is biodiversity ?

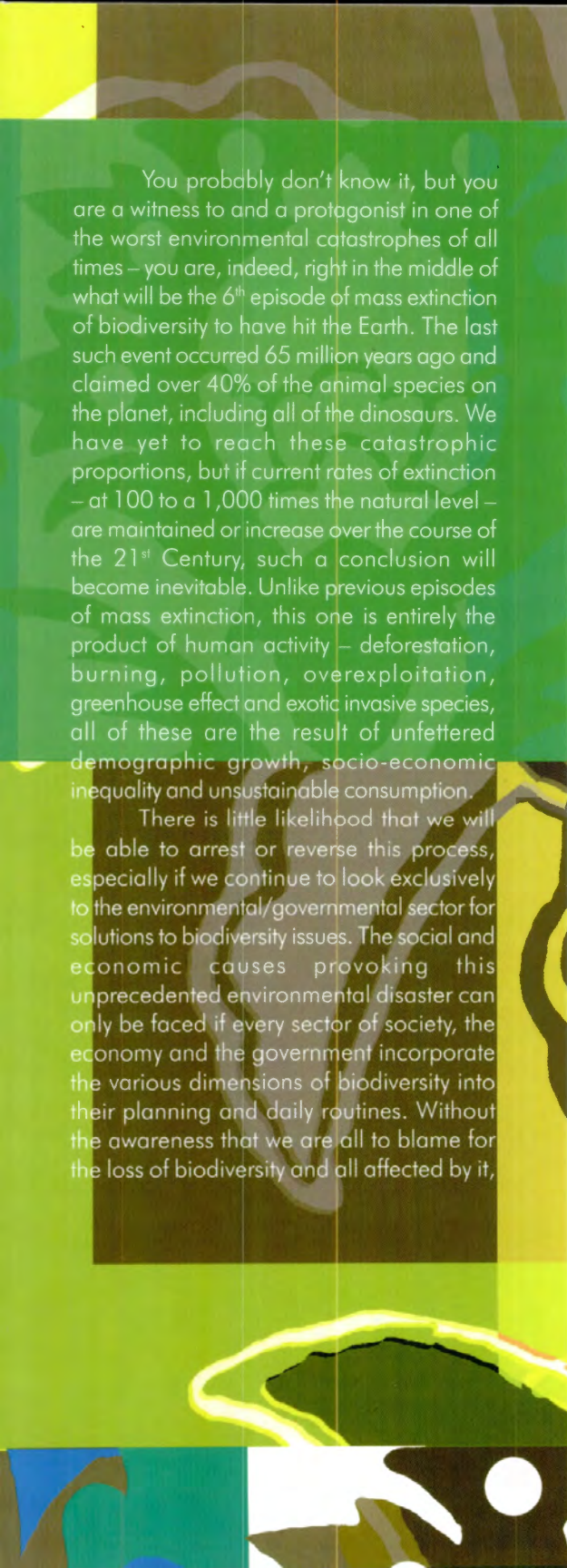
Organized by:

Nurit Bensusan, Ana Cristina Barros,  
Beatriz Bulhões e Alessandra Arantes



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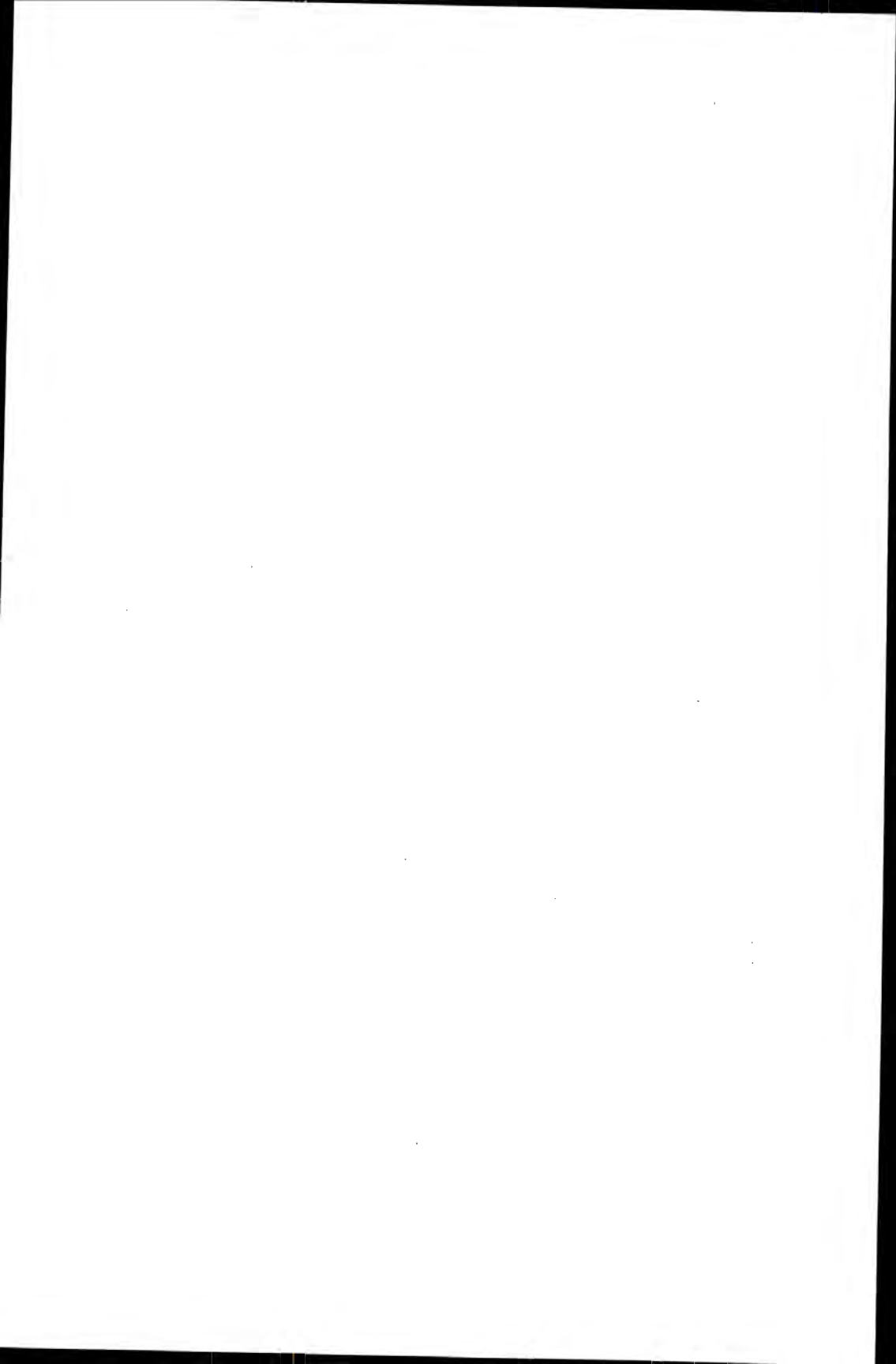


You probably don't know it, but you are a witness to and a protagonist in one of the worst environmental catastrophes of all times – you are, indeed, right in the middle of what will be the 6<sup>th</sup> episode of mass extinction of biodiversity to have hit the Earth. The last such event occurred 65 million years ago and claimed over 40% of the animal species on the planet, including all of the dinosaurs. We have yet to reach these catastrophic proportions, but if current rates of extinction – at 100 to a 1,000 times the natural level – are maintained or increase over the course of the 21<sup>st</sup> Century, such a conclusion will become inevitable. Unlike previous episodes of mass extinction, this one is entirely the product of human activity – deforestation, burning, pollution, overexploitation, greenhouse effect and exotic invasive species, all of these are the result of unfettered demographic growth, socio-economic inequality and unsustainable consumption.

There is little likelihood that we will be able to arrest or reverse this process, especially if we continue to look exclusively to the environmental/governmental sector for solutions to biodiversity issues. The social and economic causes provoking this unprecedented environmental disaster can only be faced if every sector of society, the economy and the government incorporate the various dimensions of biodiversity into their planning and daily routines. Without the awareness that we are all to blame for the loss of biodiversity and all affected by it,



What on earth  
is biodiversity?







# What on earth is biodiversity?

## Realization



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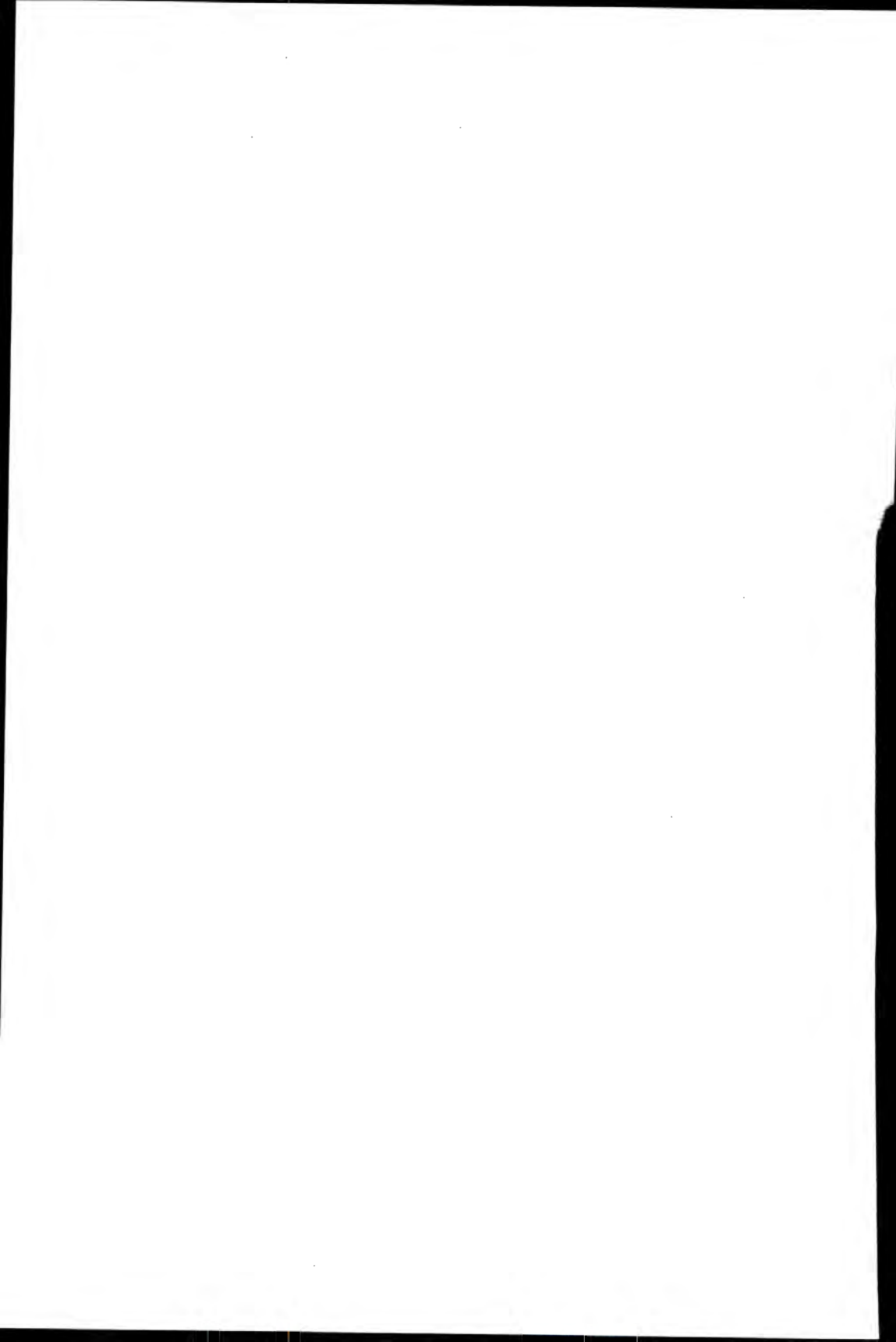
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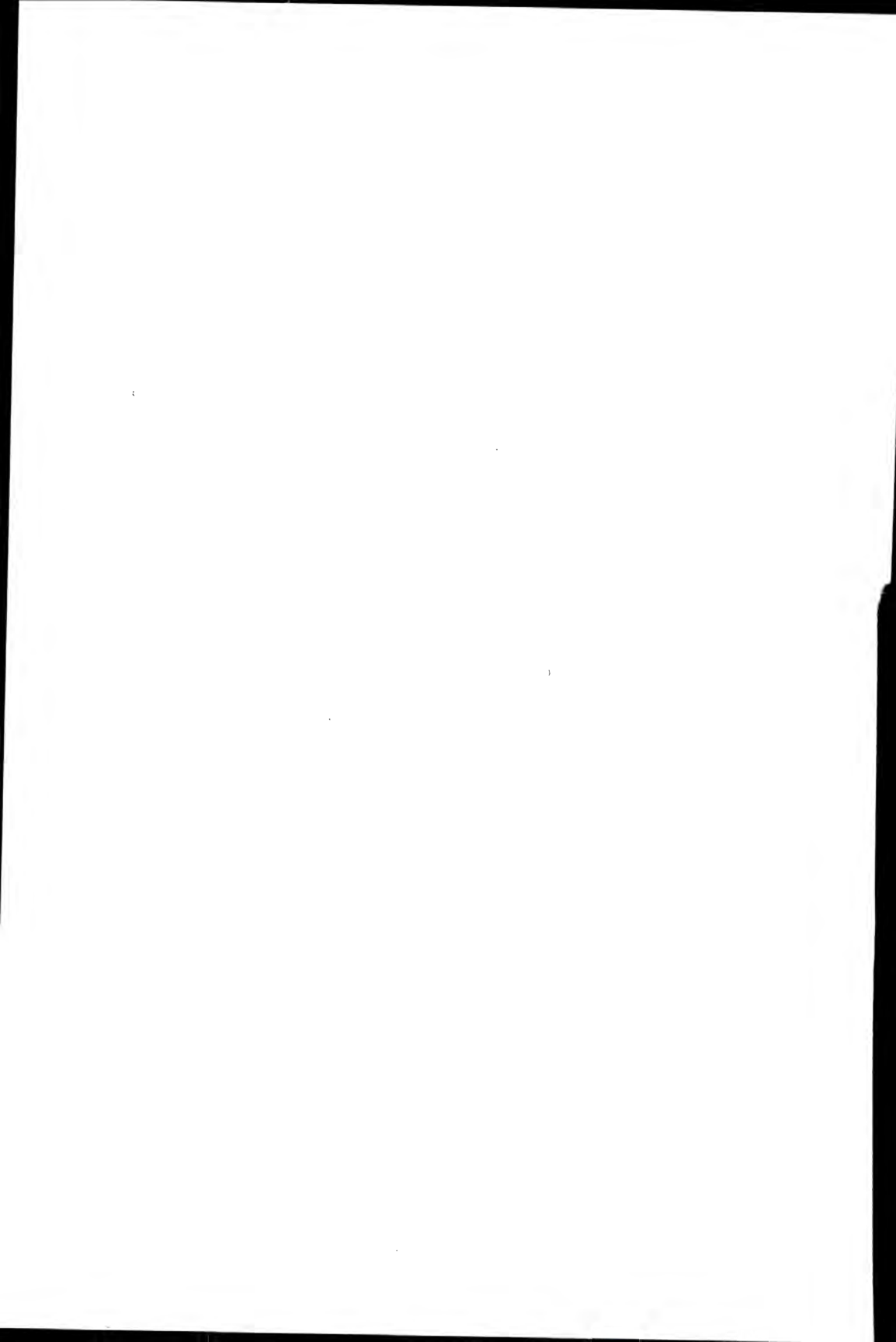
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## Presentation

The conservation of biodiversity was originally perceived as a task exclusive to the government. As time went by, society began to share in that task. The advent of the Convention on Biological Diversity (CBD) in 1992 was fundamental to this process. Initially, this came in the form of non-governmental environmental organizations developing projects in conjunction with the government, though they later began to follow their own agendas and exert some influence over the government itself. Today, we are experiencing the beginning of a new phase with the growing and auspicious insertion of the private sector. This sector, which is fundamental to the implementation of the Convention, until quite recently found itself excluded from the debate on the CBD. In this new phase, also marked by the drive to increase the Convention's degree of implementation, there is much hope that the as yet incipient insertion of other sectors in the CBD, such as local communities and academia, can be fostered and grow.

We are therefore learning that a diversity of sectors and institutions serves only to enrich and complement the individual work of each and that the route to the solution necessarily involves constructing pacts between different social players upon the solid pillars of ethics, respect, tolerance and transparency.

A stretch of this route is already behind us; that is, when we look back, we see that much has been done to implement the Convention, though when we look ahead, there is a long road left to travel – and it is necessary that this be done as quickly and as efficiently as possible.

This book was born of these convictions and of the certainty that a lot of what has been done towards fulfilling Brazil's commitments to the Convention on Biological Diversity stemmed from the initiatives of Brazilian society. Together with these original convictions is another idea: that is how it has been and is how it has to be. Otherwise put, the commitment of this country is the commitment of each and every one of us, not just the government.

With these ideas in our minds, we set about organizing this book and in doing so we were able to count on many collaborations. The greatest of these came from the authors of this book, who wrote so generously about their experiences, showing enthusiasm and engagement with the project. The editors would like to take this opportunity to thank them all.

We would also like to thank those who made this book possible, namely the institutions that share these convictions and who have supported this publication.

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Instituto Internacional de Educação do Brasil – IEB  
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WWF-Brazil

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# Introduction

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Nurit Bensusan, Ana Cristina Barros,  
Beatriz Bulhões and Henyo Trindade Barretto Filho

Biodiversity to change the world! The proposals for conservation, sustainable use and benefit-sharing, the pillars of the Convention on Biological Diversity (CBD), are enveloped in a set of innovative values in the modern world, and the facets of that innovation are innumerable. The conservation of biodiversity implies a concern with future environmental effects that confounds the predominantly short-term logic; the management of biodiversity depends on collectively negotiated decisions, both locally and globally, in a world marked by selfishness and isolation. In an increasingly more automated world dominated by "scientific certainties"<sup>1</sup>, knowledge of biological riches, their potential uses and forms of management is, in its very conception, especially when we consider genetic resources, at best uncertain. The solutions, or the hope for new directions, will emerge from the dialogue between sectors of society traditionally involved in "class struggle". The implementation of Conventions, whichever they may be, is an extra-governmental commitment, a commitment assumed by the entire national society. A national society, that is, that not only involves the actions and

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1. It is worth noting that we do recognise the important advances of science. Our concern is simply that, in their eagerness to progress, technology, which is based on science, and science itself, in some cases, tend to overrun themselves, throwing caution to the wind.



contributions of social groups, but also new rights, from the most diffuse to those of minorities, in the treatment of which the existing legal apparatus has shown itself to be less than able-handed. Finally, advances in the conservation of biodiversity require the reestablishment of a culture capable of perceiving the individual, the environment in which he or she lives and the planet as a whole.

We live in constant doubt in Brazil: are we still supreme in football? Is there anything in the world to compare with our Carnival? Are the Brazilian women really the most beautiful on earth? But there is one thing about which there can be no doubt: we are indeed world champions in biological diversity. The numbers denoting the sheer wealth of species on Brazilian land, the result of its impressive diversity of ecosystems, leave not the slightest room for hesitation. In terms of vertebrate animals, we are the country with the highest number of species of fish and mammal, the second highest number of amphibians, the third in birds and fifth in species of reptile. Brazilian flora comprises 20% of the species known on earth<sup>2</sup>. The large Brazilian biomes present an array of landscapes both amongst and within themselves.

Reaffirmed in documents and reports and plain to see for anyone who cares to take a look inside the country, we are immersed in a culture of destruction of this megabiodiversity. Of the gigantic Brazilian coastal forest, the Atlantic Forest, only 7% remains, functioning more as a reminder of the possible fate of other environments than as the result of the conservation of this biome. The Cerrado savannah, the 'biome of the day', seems to be going down a similar path, given the uncontrolled expansion of the agricultural frontier in total non-compliance with the Forest Code, showing complete disregard for protected areas or traditional populations (indigenous, *quilombo*<sup>3</sup> and others) and with no ordinance covering the use of land or natural resources. The Caatinga scrubland is also turning

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2. *Avaliação do estado de conhecimento sobre a diversidade biológica do Brasil – Sumário Executivo* (Evaluation of the state of knowledge on biological diversity in Brazil – Executive Summary). Biodiversity series, number 8, Ministry of the Environment, Brasília.

3. The term refers to traditional populations descended from former colonies of runaway slaves.

bitter – making the lives of its inhabitants even harder than it already was – and revealing frightening levels of destruction. Then comes the Amazon, our largest forest, which we see reduced each year by chunks the size of thousands of football pitches.

In the face of such devastation, the question arises, almost naturally: is it possible to conserve this megabiodiversity? Is it possible to conserve it while also developing the nation? The affirmative response to this question is the very basis of the Convention on Biological Diversity. We are looking for ways to make it real, constructing solutions and nourishing a new culture for dealing with the environment, each other and our future.

From the outset, we believe it is important to make clear that conserving biodiversity is not synonymous with preserving it untouched. There is a range of conservation strategies that also involve rational use, thus guaranteeing that the processes that generate and maintain the biodiversity remain intact, side-by-side with the direct benefits from the use of the land. The maintenance of these processes – ecological and evolutionary – is the key to sustainable use and conservation. These strategies, however, also imply the need to share both the responsibility for conservation and the benefits derived from it among the different social groups. After all, conservation is not merely an idealist's dream. Conservation is essential; it is survival. It is incumbent upon us all, the inhabitants of this planet. Conserving biodiversity ensures the essential conditions for maintaining life in the present and for the future.

Another important question that arises is: what does 'developing the nation' actually mean? For us, the development of Brazil is intimately connected with the use of natural resources and the competition for different forms of land use. Our energy comes from the rivers, the stability of the commercial balance comes from the fields, the forests generate wood, paper, cellulose and charcoal. A host of potential economic activities can be sourced in the genetics of our plants, in the tourism interested in our natural and ethnic beauties and in the more sophisticated exploration of our forest potential. This means that we have to ensure the long-term maintenance of these

resources while continuing to develop the more traditional activities of the Brazilian economy. After all, the daily lives of the people also depend on components of biodiversity. We eat biodiversity, wear biodiversity, we use biodiversity in the shower or bath, on the table and in bed. From biodiversity come our shampoos, creams, arts and crafts, towels, shoes, medicines, juices and teas. We therefore have to review our consumer behaviour. The global scene shows us that the achievements and trends of the so-called first world come at a high price, usually paid up straight in the form of natural riches, but also at the cost of disrespect to local populations and the harm caused to the environmental services that, among other factors, serve to stabilize the climate and ensure water supply to the Brazilian population. Highly consumerist cultures are short-sighted and live only for the moment, preferring to postpone the costs rather than engender a new culture that conciliates interests and necessities. In brief, much reflection is needed if we are to construct a viable and rational model of development.

With the consolidation of the conservation of biodiversity as a strategy for protection and sustainable use, in a socially balanced way, the binomial 'conservation/development' reveals itself not only as a possibility, but as an opportunity that also contributes to the implementation of the Convention on Biological Diversity.

## The Convention on Biological Diversity

The Convention on Biological Diversity, sometimes called the Biodiversity Convention, or simply the CBD, originated from a set of initiatives by conservation specialists who cherished the idea of an international instrument focused on the conservation of biodiversity worldwide. These initiatives were carried out in the 80s, at the end of which the United Nations Environmental Programme (Unep) set up a working group to assess the "appropriateness and possible form of establishing an umbrella convention to systemize the activities undertaken in this field and to deal with other themes encompassed

by the scope of that convention<sup>4</sup>". After various preliminary versions, the formal negotiation process began in 1991. Given the complexity of these negotiations, it was doubtful whether it would be possible to reach consensus on a text in time for the United Nations Conference on Environment and Development (UnCED) held in June 1992 in Rio de Janeiro. Surprisingly, on May 22 1992, in Nairobi, the nations adopted a global convention on biological diversity that was signed the following June 5 by 150 countries, a record number, at the UNCED meeting – known as Eco-92 or Rio-92. The new Convention also came into effect in admirably quick time, on December 29, 1993. The Convention proved to be a political benchmark in the history of global discussions and proposals on the development and health of the planet and its populations.

At the time, the Convention formalized new concepts believed to have revolutionary potential. In addition to the core theme of conservation in a strict sense, the CBD also introduced two very important co-themes: the sustainable use of biodiversity and the just and equitable sharing of the benefits arising from the use of genetic resources.

A little more than thirteen years later, of the three pillar-themes of the Convention, that of conservation is by far the most developed, with the greater number of instruments in place for its implementation. Perhaps more importantly, it has been the theme that has really given the CBD momentum. The proposals for sustainable use are at a less developed stage, especially because of a lack of clear tools for their implementation and because of the weak track record of involvement with economic sectors – though recent tendencies from the Convention and the productive sector would indicate some change in this regard. The sharing of benefits, on the other hand, is currently held by optimists to be something very difficult, if not impossible, to implement, and by pessimists to be merely a form of postponing or of effecting the transformation of genetic heritage into merchandise. Benefit sharing, with its Robin Hood-like proposal to share the benefits between the wealthy nations – who have the technology – and the

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4. Unep Governing Council Res. 14/26, 1987 (translated from Portuguese).

poorer countries – who have the biodiversity –, seemed to many to be a good alternative to the ever more accentuated transformation of biodiversity and natural resources into mere commercial wares. However, this benefit sharing should not be purely monetary, but ought to involve other kinds of benefit as well, such as the transfer of technology, so as to avoid a process of simply swapping biodiversity for cash.

Despite its weaknesses, the Convention played a very relevant role in helping to get the issue of biodiversity onto the agendas of nations and international agencies. By ratifying the Convention, the signatory countries accepted responsibility to guarantee the maintenance of a profusion of species, genetic material, habitats, ecosystems and landscapes; agreed to promote the sustainable use of natural resources; recognized the sovereignty of each nation over its own biodiversity; and, moreover, committed to finding the means by which to ensure the equitable sharing of the monetary and non-monetary benefits arising from the sustainable use of biodiversity.

Today, biodiversity ranks among the national concerns of many countries and its conservation and sustainable use have become prerequisites for obtaining resources from various cooperation institutions and multilateral agencies. These concerns are far clearer in speeches and documents than in their actual implementation. It is therefore necessary to recognize both the progress made in formalizing commitments and the difficulty that exists in bringing them to fruition.

### *How does the Convention work?*

The implementation of the CBD depends on each of its signatories and the international structure set up to oversee its implementation: the Convention Secretariat; the Conference of the Parties (COP); the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA); the Global Environment Facility (GEF), the Convention's financial mechanism; and the Clearing-House Mechanism (CHM) for information exchange; among other subsidiary organs.



The secretariat, located in Montreal, Canada, is responsible for preparing the meetings of the contracting parties to the CBD, providing the necessary administrative and logistical support and the basic documents required for these meetings.

The COP is the governing body of the Convention and its main function is to continuously monitor its implementation and promote its development through the decisions it takes. These decisions are made by all of the parties to the Convention and the mechanism adopted is traditionally one of consensus among the delegations representing each member state. Representatives from society can participate as observers or as members of the official delegations. Other important functions are the setting of budgets, the appraisal of national reports, the adoption of protocols and the orientation of the financial mechanism. The amplitude of the Convention is reflected in the vast agendas of the COPs. The 8<sup>th</sup> Conference of the Parties will be held in March 2006 in Curitiba, Brazil. Up to the 7<sup>th</sup> Encounter, held in February 2004, the COP had agreed a total of 182 decisions.

The SBSTTA has met eleven times and its functions are to make technical and scientific evaluations of the state of biodiversity; prepare technical and scientific analyses of the steps taken towards the implementation of the CBD; identify innovative and efficient technologies and practices and recommend ways to promote their development; oversee scientific and international cooperation research and development programmes; and respond to the scientific, technical, technological and methodological demands of the COP.

The Global Environment Facility (GEF) works as the CBD's financial mechanism while also attending three other international conventions: Climate Change, Long-range Transboundary Air Pollution and Desertification. The GEF is directed by a council of 32 nations representing the 176 participating members, and its projects are developed by the Fund's signatory parties and implementing agencies: the United Nations Development Programme (UNDP), the United Nations Environment Programme (Unep) and the World Bank. From 1991 to 2004, the GEF invested 5 billion dollars, mobilizing a further 16 billion in co-financing, through 1,500 projects in the

name of the 4 international conventions<sup>5</sup>. Of this total, 1.89 billion dollars were invested in biodiversity projects, with a further 3.8 billion being mobilized in co-financing<sup>6</sup>.

Brazil has so far contributed 11.2 million dollars to the GEF – that is, not exclusively to the CBD –, in return for which it has received approximately 188.2 million dollars of donations in the form of projects, making it the third largest beneficiary (out of 140), behind only China (454.5 million) and Mexico (210.7).

The Convention's administration is sustained by the CBD Fund, which has been up and running since 1995. In 1999, the Fund's principal budget totalled 8.3 million dollars; approximately 9 million dollars in 2000; 8.6 in 2001 and 10 million in 2002<sup>7</sup>.

Another key instrument in the CBD is its information exchange and cooperation mechanism, the Clearing-House Mechanism (CHM). Although the CHM's strategic implementation plan was drafted at the 5<sup>th</sup> COP, the mechanism's functioning is still somewhat incipient.

Over the course of the last 13 years, various thematic and transversal programmes, global initiatives, working groups and a protocol have been established to orchestrate the implementation of the CBD. Among these are the Working Groups on Agrobiodiversity, Forest Diversity, Protected Areas, Benefits sharing, Article 8j and correlated themes, and the Global Initiatives on Taxonomy and Pollinators, and the Cartagena Biosafety Protocol.

Even so, the Convention is generally considered to have achieved a low level of implementation. In recognition of this fact, the 6<sup>th</sup> Conference of the Parties (COP-6, held at the Hague in April 2002) created a working group to study ways of promoting CBD implementation. A strategic plan for the Convention was also adopted, which included the target of reaching a significant reduction in the rates of biodiversity loss by 2010. This target was endorsed by Heads of State

5. GEF Annual Report, 2004: Producing Results for the Global Environment (<http://www.gefweb.org>, in pdf format)

6. GEF web page - Focal Areas (<http://www.gefweb.org>)

7. The Fridjof Nansen Institute, 2001. Yearbook of International Co-operation on Environment and Development. Earthscan Publications, England.

during the World Sustainable Development Conference in Johannesburg in 2002 and by the United Nations General Assembly. The need to accelerate this process and to incorporate all of the relevant players, including the private sector, scientific community and traditional communities, was also recognized. Perhaps of all the reasons for the disappointing level of implementation of the CBD, the multiplicity of interests involved in certain themes is the most pronounced. At the upcoming COP, to be held in Curitiba, the group will present their results and recommend the adoption of new mechanisms and devices for the CBD. Of these suggested mechanisms, closer ties with the private sector has been the subject of discussions in the working groups at the last two encounters (London, February 2005 and São Paulo, November 2005) as part of a process entitled "Business and the 2010 Biodiversity Challenge".

To date, 187 countries and the entire European Union have signed the CBD. Among the 165 nations that have ratified the Convention, the most significant absentee is the United States. This absence possibly reflects the economic implications of the CBD. Since the early days of the Convention there has been some tension between the countries of the northern hemisphere, which have more financial resources, and those of the southern hemisphere, home to the lion's share of the biodiversity<sup>8</sup>. This divide between countries, or hemispheres, tends to be eclipsed when it comes to matters of an economic interest, such as the debates on the Cartagena Biosafety Protocol or those on forest biodiversity, where sector-based representation tends to predominate (agricultural export, biosafety, logging and, as in the case of the Brazilian Amazon, even military interests).

On the other hand, this North/South divide becomes more explicit when it comes to access to genetic resources and associated knowledge and practices and intellectual property rights. In this case, the northern countries, which have the technology, are interested in obtaining these resources with a view to developing products,

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8. The "southern hemisphere" is here understood as a set of countries that house considerable biological diversity, not simply all those below the Equator.



such as medicines and cosmetics, while the southern countries, which possess the genetic resources, want to establish mechanisms whereby they can receive fair remuneration for granting access to their genetic heritage and traditional knowledge, a just and equitable share of the benefits arising from the use of those resources and the transfer of technology.

### *What has been done in Brazil?*

Brazil ratified the CBD in February 1994 and this led to various themes hitherto rarely considered being included on the country's environmental and development agenda. For example, such issues as access to genetic resources, associated traditional knowledge and benefitsharing were, as far back as 1995, already the subject of a bill of law and are, today, partially regulated under Provisional Measure nº 2186-16 of August 2001. Biosafety also started to receive treatment under Brazilian law in 1995. However, both issues are still pending further regulation and are the source of a great deal of controversy among various sectors of the government and society. Some aspects, mainly related to the conservation of biodiversity, such as protected areas, have been given new lease of life through the adoption of the CBD's working groups.

Our nation has been a strong presence within the CBD over the course of the last 13 years, principally in virtue of its megadiversity and the technical capacity of its delegations, and has also, as mentioned above, been one of the countries that have contributed financially to the Fund. Between 1995 and 1997, Brazil occupied the Vice-Presidency of the Latin American and Caribbean Group (GRULAC)<sup>9</sup>. Brazil has also had visibility in its roles in the CHM and working group on agrobiodiversity. With regard to the CHM, Brazil chaired a series of meetings and produced documents that had considerable influence on the recommendations the Convention later adopted.

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9. Cf. First National Report to the Convention on Biological Diversity, published by the Ministry of the Environment in 1998.

As for agrobiodiversity, Brazil made a proposal at the SBSTTA-2, held in 1996, on how to reduce the impact of agriculture upon biological diversity, mainly in relation to the homogenisation of landscapes and the loss of species and ecological processes. This proposal, in conjunction with another from the Swiss government, served as the base for an SBSTTA recommendation. At COP-3, through the negotiations coordinated by the Brazilian delegation, a decision was approved on the theme that, among other topics, recognized agrobiodiversity as one of the key themes of the Convention and established a working group with an ample scope to launch activities related to pollinators and symbiotic soil micro-organisms<sup>10</sup>.

Two other recent achievements must also go down in the history of Brazil's performance within the CBD. In 2004, the COP-7, held in Kuala Lumpur in Malaysia, approved the Working Group on Protected Areas, which assumed an innovative and highly pragmatic format and encompassed a vast array of actions, all with established targets and timeframes. The Brazilian delegation made an effective contribution to this approval process, both in the preliminary discussions and through its poignant declarations during the COP. Even more recently, in 2005, Brazil also helped coordinate the process to integrate the private sector within the Convention through a partnership between the Secretariat of the Convention, the British government and non-governmental and business organizations.

On the other hand, Brazil's participation in other areas has been negative, such as on the issue of forest biodiversity, where it has prevented the discussions from making any significant progress. A Working Group on Forest Biodiversity was approved at COP-6, in 2002. The negotiations were very difficult, particularly as Brazil defended the stance that each nation should establish its own priorities independently, as opposed to setting international priorities for the

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10. Bensusan, N. 2002. Convention on Biological Biodiversity (CBD). In: Meio ambiente Brasil. Avanços e obstáculos pós-Rio-92. A. Camargo, J.P.R. Capobianco & J.A.P. Oliveira (orgs). Estação Liberdade, Instituto Socioambiental - ISA, São Paulo & Fundação Getúlio Vargas, Rio de Janeiro. pp. 69-78.

programme. Due to this position assumed by Brazil, the Convention ended up adopting a weak programme devoid of targets or set priorities.

With regard to the Cartagena Biosafety Protocol, Brazil's role has recently been controversial, particularly as a reflection of the multitude of interests in the country on the issue of the Protocol. At MOP-2 (Second Meeting of the Parties to the Cartagena Protocol on Biosafety, held in Montreal in June 2005), the country delayed the definition of certain issues, such as the labelling of products with transgenic content, for example.

In summary, the CBD has so far brought about the introduction of new themes to the environmental agenda. In some cases, such as protected areas and the knowledge of biodiversity, there has been significant progress, while, in relation to agricultural biodiversity, taxonomy and the development of instruments that allow for the sustainable use of biodiversity, the progress has been relative and much remains to be done. However, in other areas, such as the access to genetic resources, benefit sharing and the transfer of technology, there has been very little progress. The CBD, partly due to its enormous complexity, among other factors, still finds itself at an early stage of implementation.

Another initiative worthy of mention was the drafting of a National Biodiversity Policy, which Brazil, like all the other signatory nations, committed to doing when it adhered to the CBD. The Ministry of the Environment, with the support of non-governmental organizations, set in motion a vast process of consultation with a view to drawing up this document, which became a Decree in 2002<sup>11</sup>. However, despite all this effort, various segments of the government and society were left out of this process, which resulted in the production of a document lacking in political expression.

It is worth emphasizing that the implementation of the CBD in Brazil, although limited, is the fruit of the efforts of Brazilian society as a whole, not just of the government, which is precisely the focus of this book. The capacity of the Brazilian non-governmental organizations is worthy of note and has fulfilled a relevant role in

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11. Decree 4.339, of August 22, 2002.

meeting the targets of the CBD. A portion of Brazilian companies is engaged with the drive to bring the Convention to fruition and the practices these companies have adopted have served as a good example to other companies and to the consumer. In many cases, fruitful partnerships have been struck between companies and NGOs, fostering both the conservation and sustainable use of biodiversity. This is undoubtedly fertile and as yet little explored ground for promoting the implementation of the Convention in Brazil. Information has also played an important role in the implementation process. The emergence of specialized vehicles on the theme and the subject's constant presence in the general media show, among other things, the level of public interest it has managed to awaken.

*The CBD on the eve of its Eighth Conference of the Parties (COP-8): a crossroads?*

The recognition that the Convention has shown low levels of implementation and must, therefore, seek more efficient ways to proceed was an important step towards a more promising future. Even so, various issues linger that could darken that future, such as a lack of balance in the levels of implementation of the three fundamental objectives of the CBD – conservation, sustainable use and the sharing of benefits arising from the use of genetic resources. This unbalance risks turning the CBD into nothing more than a classic instrument for the conservation of biodiversity. The innovations set down in the text of the Convention therefore face the danger of becoming diluted in their continuous non-implementation.

Another key question is the allocation of financial resources for the fulfilment of the three CBD objectives. In more than a decade since the Convention began, the GEF has invested less than 2 billion in projects connected with biodiversity, mobilizing co-financing of a further 3.8 billion. These figures have been resoundingly insufficient to implement the Convention, a complaint that has been given special space at the 2006 COP, when the GEF will decide its fourth replenishment (for the period 2006-2010), which ought to draw in the discussions



on the three other Conventions as well, which will likewise and understandably also want greater funding. In addition to reinforced investment from the Global Facility, much larger than for the conservation of biodiversity alone, there is also the need to search for alternative sources of funding. Among the possibilities in view are the inclusion of environmental criteria in the analysis of requests for credit for development projects, the exploration of cooperation with the private sector and the more efficient management of national resources.

As for the unbalance among the objectives, the issue of benefit-sharing is going through a decisive moment. In addition to there being no successful examples of the implementation of this instrument, various voices have been raised in criticism of the model of sharing established by the CBD, which they consider merely a disguised form of commercialisation. COP-8 will be extremely important as, in addition to the discussion on new ways to implement the CBD, the international regime for access to genetic resources, still under development, will be one of the main themes raised. The idea behind this regime adopted by the Convention arose from a mandate during the World Summit on Sustainable Development (the so-called Rio+ 10), held in Johannesburg in September 2002.

Other general issues of the Convention will be important at this upcoming Conference of the Parties, such as the creation of an instrument to facilitate training and education in megadiverse countries, ways of implementing the technology transfer programme and improving information sharing on successful experiences with the three chief objectives of the CBD.

Many believe that this "homecoming" of the CBD signifies the closing of a cycle. That is, the Convention was opened for signatures in Brazil and now, nearly fourteen years later, is coming back to self-reflect and seek new force. This could mean that the Convention will acquire new and more efficient tools for implementing its three primary goals and enter a new phase of great progress, or, it could result in an (undesirable) direction towards consolidation as an instrument for the protection of biodiversity void of any genuine interaction with "the real world". This is a choice it falls to us all to make.

## About this book

This book is an attempt to show that Brazilian society made its choice to engage in the implementation of the Convention on Biodiversity. It includes various experiences of NGOs, companies and media vehicles in their quest to fulfil the Convention's objectives. The cases described here do not pretend to exhaust the array of experiences in the implementation of the CBD championed by Brazilian society, but merely to offer a sample of what has been done and of the much that still can – and must – be done towards this end.

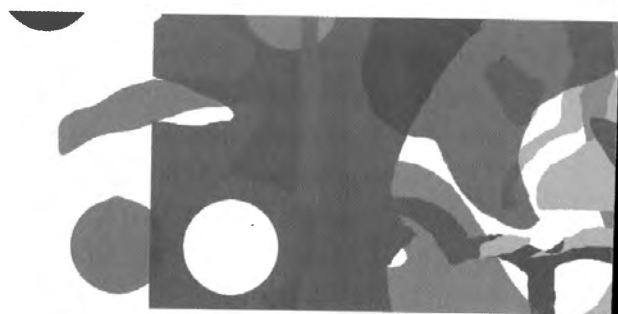
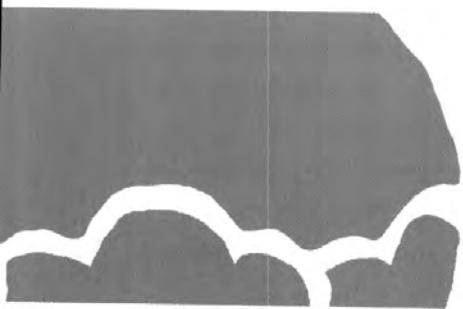
The book is organized into three sections: firstly “Hands-on”, which deals with the actions of institutions directly involved in the conservation and sustainable use of biodiversity. These are institutions that work in the field, with species, genetic resources, ecosystems and human communities, creating opportunities for conservation and promoting more rational ways of using natural resources.

The second section, entitled “Give me a helping push and I'll move the world”, deals with institutions that run programmes or sets of actions that stimulate the conservation and sustainable use of biodiversity. These organizations work by raising funds for conservation, aggregating value to products derived from biodiversity, sponsoring the activities of other institutions and providing incentives for projects that demonstrate environmental sustainability.

The third and final section, “Wide-eyed and open-hearted”, brings together experiences related to information on biodiversity in the media and the effort to valorise the knowledge of the indigenous peoples, especially by informing society as to the importance of that knowledge.

The final chapter, under the guise of a conclusion, briefly examines the way in which biodiversity has been treated by the Brazilian state and the new challenges that have come with the beginning of this century.

The editors believe that the sample assembled here reveals the extensiveness of what Brazilian society has been doing to implement the CBD. More than this, this group of experiences also shows how much more could be done with greater interaction between the various sectors of society.

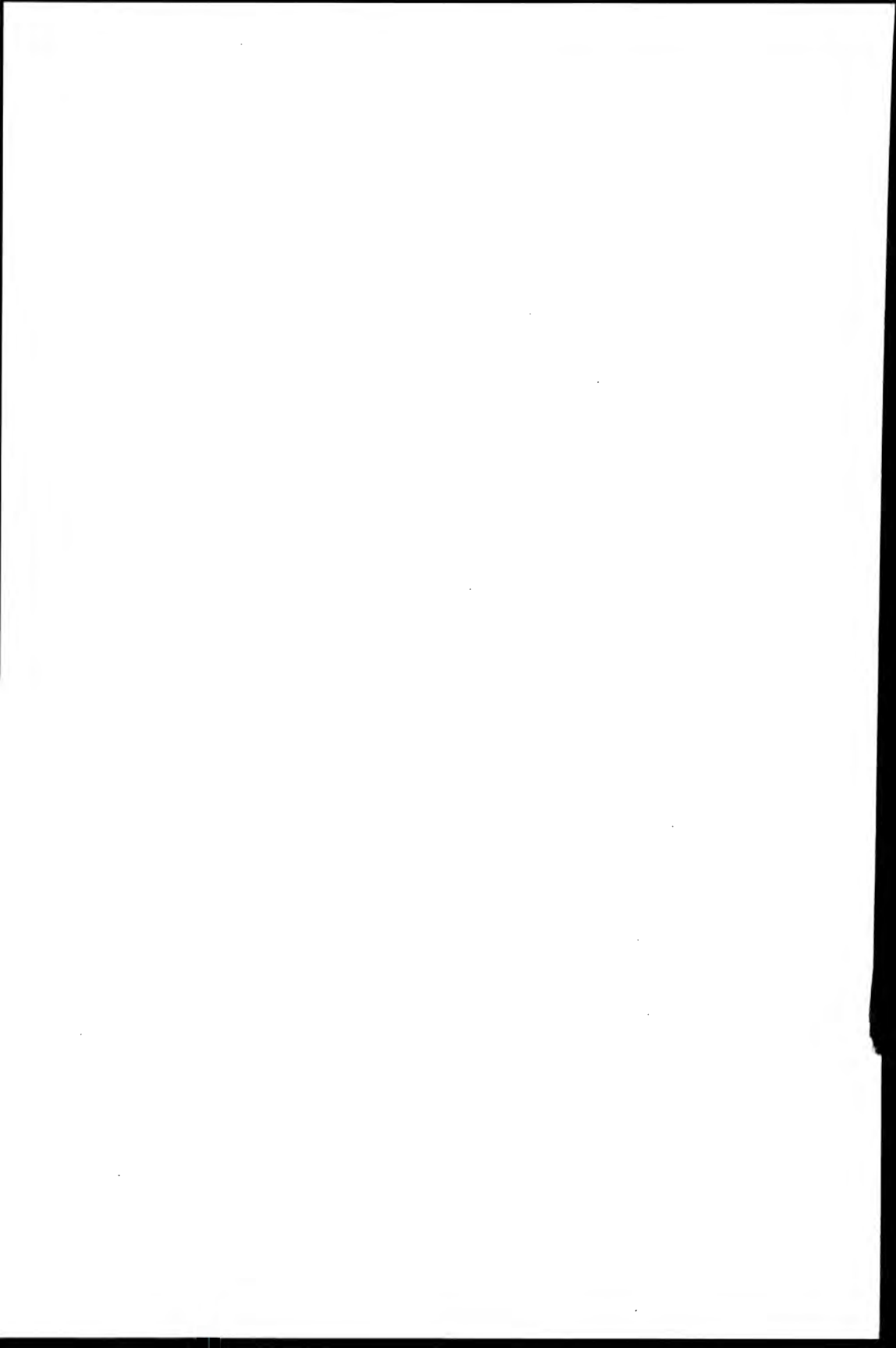




# Hands-on







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# The contribution of *Fundação Biodiversitas* to the implementation of Article 7 of the Convention on Biological Diversity

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Gláucia Moreira Drummond  
Yasmine Antonini

## The Convention on Biological Diversity

Preservation, sustainable use and the sharing of benefits arising from biodiversity are integral features of the government's commitment to promoting equitable and sustainable development in Brazil. The drafting of a national biodiversity strategy is one of the country's obligations as a signatory of the Convention on Biological Diversity (CBD).

As the nation that houses the highest levels of biodiversity of the 17 countries considered "megadiverse", together home to 70% of the animal and vegetal species catalogued worldwide to date, this strategy is of extreme importance to Brazil. It is estimated that the country holds 15 to 20% of the world's biodiversity and the largest number of endemic species anywhere on earth; an important resource, both in terms of the environmental services this biodiversity provides and of the opportunities for development and sustainable use it offers.

Given its position, Brazil determined that its national biodiversity strategy presupposed the implementation of a legal standard, a national biodiversity policy, developed in conjunction with Brazilian society and implemented through the specially instituted *Programa Nacional de Biodiversidade* – Pronabio (National Biodiversity Program).

In order to set up Pronabio, the Ministry of the Environment carried out five "biome evaluations" during the period 1998/2000, identifying 900 priority areas and actions for the conservation of

biodiversity in the Cerrado savannah, Pantanal swampland, Caatinga scrubland, Atlantic forest, the Southern pastureland, the Amazon and the Coastal/Marine zone.

Among other recommendations, the findings of the workshops proposed effecting change (albeit small and gradual) in the quality of life of Brazilian society by creating viable production alternatives in line with environmental conservation. The Program's main challenge is to show the direct benefits of the conservation and sustainable use of biodiversity for the populations engaged in conservation activities and to focus its efforts on maximising and guaranteeing those benefits.

One fundamental point is that biodiversity management should not be restricted to the environmental area, but should actually be a part of all of the actions of the government and society. This transversal character is essential because the use of natural resources is at the very base of all productive activity and any development strategy employed will necessarily have a bearing on the conservation of biological diversity and have a modifying effect on the quality of life of the population. In order to have a society that makes sustainable use of nature, the thought of sustainability must first be made present at all levels of that society. The only way this goal can be achieved is through integration between the various levels of public power and society.

The CBD was signed by Brazil in June 1992 and ratified by the National Congress in May 1994. The Convention's goal is "the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding".

#### *Article 7 of the CBD*

Article 7 of the CBD deals with the identification and monitoring of components of biological diversity that are important for its conservation and sustainable use.

As such, each contracting party shall, "as far as possible and as appropriate, in particular for the purposes of Articles 8 to 10, monitor, through sampling and other techniques, the components of biological diversity, paying particular attention to those requiring urgent conservation measures and those which offer the greatest potential for sustainable use; identify processes and categories of activities which have or are likely to have significant adverse impacts on the conservation and sustainable use of biological diversity, and monitor their effects through sampling and other techniques; and, finally, maintain and organize, by any mechanism, data derived from the identification and monitoring activities".

### Examples of actions by *Fundação Biodiversitas* in support of the CBD

Attending to its conservationist goals, which contribute directly or indirectly to the implementation of Article 7 of the CBD, the *Fundação Biodiversitas* (Biodiversitas Foundation) carries out actions that include surveys on Brazilian ecosystems and species of fauna and flora; the identification of endangered species; the identification of priority areas for the conservation of biodiversity; the creation and management of protected areas; environmental planning; professional training in conservation biology, environmental education and geographical information systems; the hosting of scientific/technical and environmental education events; the publication of technical and promotional books; propositions for environmental management systems; and the analysis of legal recourses for conservation.

Concerned with reconciling conservation and development, *Fundação Biodiversitas* has come to the fore in the creation and execution of interdisciplinary projects whose main focus is to gauge the interaction between the environment and the population through the study of its demographic and economic aspects.

Another concern at *Fundação Biodiversitas* is to transmit information to the general public in an accessible manner, though without

losing scientific rigour, and to work towards the creation of an environmental ethic that, in the case of biodiversity, boils down to the principle of respect for life. These non-cognitive values in environmental education are the master spring that motivates and buoys the Foundation's work, which is couched in the belief that initiatives for environmental protection can only be successful if they have the full understanding and support of a well informed and engaged public.

### *Conservation of Biodiversity*

Defining the conservation status of species of fauna and flora and compiling lists of endangered species are elements of the strategy *Biodiversitas* adopted to subsidise conservation projects and policies throughout the country. The surveying, systemising and specialising of biological data are some of the tools used to monitor Brazilian biodiversity.

*Biodiversitas* started divulging its red lists in 1990 with the publication of "*Fauna Brasileira Ameaçada de Extinção*" (Endangered Brazilian Fauna), which contained the Official List published by Ibama in Edict 1522 of December 1989. In 1994, the Foundation compiled its first red book for Brazil – *Livro Vermelho dos Mamíferos Brasileiros Ameaçados de Extinção* (The Red Book of Endangered Brazilian Mammals) –, containing information on each of the species that featured on the Brazilian list. That same year it also published "*Mamíferos Brasileiros: uma Coletânea Bibliográfica*" (Brazilian Mammals: a Bibliographical Collection), with 1,986 bibliographical references on the behaviour, ecology and distribution of Brazilian mammals.

In 1995 and 1997 *Fundação Biodiversitas* evaluated the status of species of fauna and flora (in that order) in the state of Minas Gerais. The methodology used to compile the List of Endangered Species of Fauna in Minas Gerais and the List of Endangered Species of Flora in Minas Gerais entailed an extensive prior bibliographical survey, the involvement of specialists on the issue and wide-reaching consultation with researchers. This approach revealed significant progress in comparison with the traditional methods used to assess the conditions of

species in nature. With a view to promoting this methodology and facilitating its adoption elsewhere, *Biodiversitas* published a methodological manual for the compilation of endangered species lists in 1997, in which it suggested the use of the extinction risk criteria proposed by the World Conservation Union (IUCN). The reason behind the adoption of the IUCN scientific criteria in these evaluations is to standardise the quality of the information sought and make it possible to verify the conservation status of species in spatial and temporal scales. The *Livro Vermelho das Espécies Ameaçadas de Extinção da Fauna de Minas Gerais* (The Red Book of Endangered Species of Fauna in Minas Gerais) was published in 1998, followed by the *Lista Vermelha das Espécies Ameaçadas de Extinção da Flora de Minas Gerais* (The Red List of Endangered Species of Flora in Minas Gerais) in 2002, which was of great value in monitoring the State's botanical species. The methodology adopted by the *Fundação Biodiversitas* became a reference in Brazil and various states followed the example of Minas Gerais by compiling their own endangered species lists.

The most recent revision of the Official List of Endangered Species of Brazilian Fauna, coordinated by *Fundação Biodiversitas* and published in Normative Instructions numbers 03, of 27 May 2003, and 05, of 22 May 2004, became particularly important given the accelerated environmental modifications that have occurred since the list's initial compilation in 1989. As an example, data from *Fundação SOS Mata Atlântica* (The SOS Atlantic Forest Foundation) shows that, during the period 1995 to 2000, approximately 121,000 hectares of Atlantic Forest were felled. The situation in the Cerrado and Caatinga is no different. Data published in 1998 in the Ministry of the Environment's "*Primeiro Relatório Nacional para a Convenção sobre Diversidade Biológica*" (First National Report on the Convention on Biological Diversity) indicates that 40% of the Cerrado has been converted for agricultural purposes, with total loss of its original vegetation, while less than 50% of the original area of the Caatinga biome remains in its original state. On the other hand, over the last ten years, new scientific information has emerged on almost all of the zoological groups, providing an excellent support from which to redefine conservation

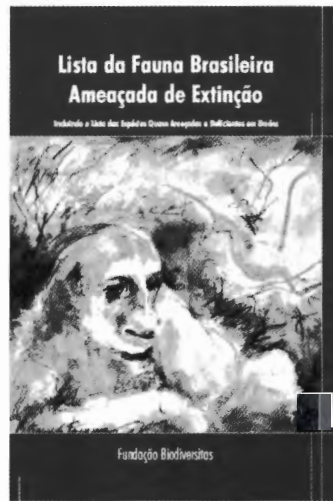
status, adding and removing species from the lists. A lack of information when the original list was drafted in 1989 meant that important groups, including fish and chiropteran species and various groups of invertebrates were left off, a failing duly corrected in the revised edition.

The periodic revision of the List of Endangered Brazilian Species is a fundamental strategy towards preserving the main function of the document, which is to help prioritise resources and actions for the protection of species and to alert society and governments as to the need to adopt effective biodiversity protection measures on local, regional and global levels.

### *List of Endangered Brazilian Fauna*

The revised list of endangered species of Brazilian fauna was published by *Fundação Biodiversitas* in July 2005 as a way of studying the country's endangered species list in the light of scientific knowledge about the species and in conformity with the evaluation criteria defined by the IUCN – World Conservation Union.

This publication groups all of the species listed as endangered under the different taxonomical groups evaluated: mammals, birds, reptiles, amphibians, fish, and terrestrial and aquatic invertebrates. Unlike on the lists released by the public organs, the threat category for each of the listed species is also given, plus a description of what that category means, so as to facilitate in the adoption of the most appropriate measures to address that species' conservation status. These categories clarify the risk of disappearance for each species, whether in the short, medium or long term. This enables the decision makers, research institutes and conservationists to direct their efforts and investment more effectively for the protection of endangered species.





Another important feature of the book is that it lists the countless species that are neglected in terms of scientific investigation and which supposedly therefore run the risk of disappearing before being properly classified. The expected result of this initiative is to encourage development institutions to establish programs and lines of research that prioritise the production of knowledge about these species.

The disclosure of this information is another important step that has come of the revision and standardisation of these types of list, as it makes the conservation status of the nation's species accessible to society as a whole, so that it can assume its parcel of the responsibility and become a partner in actions to protect and/or rescue endangered species.

### *The Red Book of Endangered Brazilian Fauna*

In addition to the list, the scientific coordination and publication of the Red Book of Endangered Brazilian Fauna was one of the goals attained by *Fundação Biodiversitas*. With financial support from Probio – *Projeto de Conservação e Utilização Sustentável da Diversidade Biológica Brasileira* (Project for the Conservation and Sustainable Use of Brazilian Biological Diversity), the Book contains a taxonomical and bio-ecological description of each endangered species and outlines the main threats they face. In addition to being an important tool in environmental education, the Book is also helpful in re-assessing the measures adopted for the protection of our species of fauna, redirecting them where necessary and making them more effective or even more rigid in accordance with the conservation status evaluations. It is important to mention that these evaluations and the subsequent revision of the country's official endangered species list were only possible thanks to the participation of more than two hundred scientists working in the collation and systemisation of data on Brazilian species.

Among the general themes treated in the Red Book of Endangered Brazilian Fauna is a chapter on the country's current environmental legislation. This chapter discusses the prevailing legal framework and the need to perfect it so as to facilitate inspection and policing



and efforts to curb bio-piracy, trafficking, habitat destruction and over-fishing/hunting.

An important focus in the Book is the recommendation of strategies to be either adopted or improved in order to bring greater agility to the conservation and recovery of the nation's endangered fauna, such as the development of a permanent and dynamic database widely accessible to various sectors of Brazilian society; the creation of in-situ and ex-situ conservation programs; incentives for environmental education programs; the stimulation of research through grant funds supported by public/private partnerships, co-operation agreements and foreign sources, etc.

## List of Endangered Brazilian Flora

The revision of the list of endangered Brazilian flora was a joint action executed through a cooperation agreement with Ibama – *Instituto Brasileiro de Meio Ambiente e dos Recursos Naturais Renováveis* (Brazilian Institute for the Environment and Renewable Natural Resources) and a partnership with the energy company Furnas Centrais Elétricas. More than two hundred specialists in a range of different plant families from the Brazilian Botanical Society and the Rio de Janeiro Botanical Gardens worked alongside government technicians to update the list of endangered Brazilian flora 13 years after it was originally published by Ibama in Edict 37 N of April 1992. As with the extinction risk assessments carried out on Brazilian fauna, the IUCN criteria were also used in the studies on botanical species. The results showed that, according to current knowledge on the nation's flora, 1,538 species are now in danger of extinction. It is hoped that this new list will lead to better-directed and optimised conservation efforts throughout the country. *Fundação Biodiversitas* is calling for the wide-reaching dissemination of these findings so that the organs and entities responsible for managing natural resources can implement controls and set targets for the recovery and protection of these species of Brazilian flora and, consequently, their native habitats.

## The Brazilian Atlantic Forest Endangered Species Protection Program

Implemented in December 2003 with funding from the CEPF – Critical Ecosystem Partnership Fund, the Brazilian Atlantic Forest Endangered Species Protection Program aims to recover Atlantic Forest species in danger of extinction by supporting research and surveys that could provide some answers and solutions in the recovery and management of endangered species. The Program's projects are selected through specific edicts and receive a budget in the order of US\$ 10,000.00. The Program favours projects that search for information that will clearly lead to the proposal and adoption of effective measures for conserving endangered fauna and flora, such as studies that establish correlations between population dynamics and size; extensive inventories to investigate distribution and occurrence covering a comprehensive range of points of survey; the identification and description of key habitats in terms of the territorial range and degree of conservation; the identification of potential threats and their probable effects on the populations, including genetic effects, etc. *Fundação Biodiversitas* and Capan – *Centro de Pesquisas Ambientais do Nordeste* (Northeastern Environmental Research Centre), one of its partners on the Program, look to bring the specific results and strategies of the projects to other conservationist entities, research centres, decision makers, opinion formers and social agents with influence over public policy in a bid to secure advances in the recovery and conservation of endangered species. Below is a list of the 32 projects (dealing with 39 species) the Program supported through its first two edicts (2004 and 2005):



1. Proposal of Criteria for the Identification of Areas Suitable for the Maintenance of Populations of *Heliconius nattereri* (Lepidoptera, Heliconiinae) through the Analysis of its Interactions

with its Host Plant, Competition with other *Heliconia* and Border Effect.

2. Fundaments for the Conservation of Natural Imperial Tree Fern Populations (*Dicksonia selloviana* (Presl.) Hooker).
3. Study of the distribution of Brazilian Merganser (*Mergus octosetaceus*) populations on tributaries of Rio Grande in the Southeast of Minas Gerais.
4. Geographic distribution and habitat of the Fringe-backed fire-eye (*Pyriglena atra*) (Swainson, 1825; Aves: Thamnophilidae), scenarios for priority management and conservation actions.
5. "Program for the conservation of the black-faced lion tamarin (*Leontopithecus caissara*): preliminary studies of the continental population for future translocations".
6. Distribution, population density and natural history of *Scinax alcatraz* (Amphibian) in Alcatrazes, São Paulo.
7. Endangered Birds of Central Pernambuco.
8. *Phyllomys unicolor*: critically endangered?
9. Biology and Management of the mangrove crab *Ucides cordatus* (Crustacea, Brachyura, Ocypodidae).
10. Conservation of *Dyckia* bromeliads in Southern Bahia.
11. Study on *Adelophryne* (HOOGMOED & LESCURE, 1984) populations in fragmented areas of the state of Ceará to support the development of conservation strategies.
12. Population density and conservation status of three critically endangered primate species in the Pardo and Jequitinhonha river valleys in Minas Gerais and Bahia.
13. Occurrence and area of distribution of the rare neo-tropical fish *Henochilus weatlandii* and the long-whiskered catfish *Steindachneridion doceana* in the Doce river basin in the states of Minas Gerais and Espírito Santo.
14. Distribution and status of *Callicebus barbarabrownae*, Hershkovitz 1990.
15. Conservation study for the lowland tapir *Ocotea odorifera* in the Atlantic Forest of Rio Grande do Sul.

16. Genetic diversity and gene flow in natural brazilwood populations through microsatellite markers.
17. Implantation of a Germplasm Bank for the conservation of brazilwood.
18. Structure and dynamic of populations of *Caesalpinia echinata* (brazilwood) in Atlantic Forest remnants on the north coast of Paraíba.
19. Demographic studies of *Chrysophyllum imperiale* (Linden ex Koch) Bentham & Hooker (Sapotaceae) in the region of the Rio Doce State Park and surroundings in Minas Gerais: structure, size, geographic distribution and allometry.
20. Ecological reproduction of *Calycorectes australis* (Myrtaceae) in Atlantic Forest in the south of São Paulo State.
21. "Biogeography and Conservation of *Rhagomys rufescens* and *Wilfredomys oenax* in the Atlantic Forest" – Location: Atlantic Forest (broad sense) of the states of Minas Gerais, Rio de Janeiro, São Paulo, Paraná, Santa Catarina and Rio Grande do Sul.
22. Beginning, middle and end: three different fates for three isolated populations of the three-toed sloth *Bradypus torquatus* (*Xenarthra*: *Bradypodidae*).
23. "Demography and population viability of the three-toed sloth *Bradypus torquatus* (*Xenarthra*: *Bradypodidae*).
24. Northern muriqui *Brachyteles hypoxanthus* (Primates, *Atelidae*) population structure at the Caparaó National Park.
25. Population parameters, geographic distribution and conservation of the Southern muriqui (*Brachyteles arachnoides* – Primates) in São Paulo state.
26. Population assessment, demographic parameters and habitat associations of *Crax blumenbachii* in the region of the Uma Biological Reserve in Bahia.
27. Geographic distribution and habitat use of the restinga antwren *Formicivora littoralis*.
28. "In Search of Chuá – Occurrence, Abundance and Habitat Conditions of *Amazona rhodocorytha*".

29. "Density, distribution and viability of populations of the black-fronted piping-guan (*Aburria jacutinga*) in protected areas of Atlantic Forest in São Paulo State".
30. Distribution and ecology of the thorny catfish *Kalyptodoras bahiensis* Higuchi, Britski & Garavello, 1990, (Siluriformes – Doradidae) in the Paraguaçu river basin in Bahia State.
31. The conservation of *Liolaemus Lutzae*, a sand lizard endemic to the restinga soils of Rio de Janeiro state. Threatened with extinction.
32. Potential distribution of *Leptagrion acutum* (SANTOS, 1961).

## Protected areas

Investing in the planning, creation, management and handling of protected areas is the goal of this *Biodiversitas*, Program. The methodology the institution adopted for the work seeks cooperation between the protected area and its surroundings, taking into account the interests of the various stakeholders involved. To complement the Program's initiatives, encouragement is also given for the creation of private reserves.

As its contribution to this Program, *Fundação Biodiversitas* maintains two protected areas: one in the Atlantic Forest of Minas Gerais and another in the Caatinga scrubland of Bahia.

### *Mata do Sossego Private Natural Heritage Reserve*

Located in the most extensive and best preserved contiguous remnant of Atlantic Forest in the region of the municipalities of Simonésia and Manhuaçu, the 180 hectares of the Mata do Sossego are the natural habitat for various endangered species, such as the Northern muriqui (*Brachyteles hypoxanthus*), the puma (*Puma concolor*), rose-coloured *jequitibá* tree (*Cariniana legalis*) and imperial tree fern (*Dicksonia sellowiana*).

The perpetual protection of Mata do Sossego was secured in 1998 with the establishment of the PNHR (Private Natural Heritage Reserve). The Mata do Sossego PNHR harbours enormous potential for biological, ecological and sociological research. Chief among the activities run at the PNHR are the environmental awareness and social organization initiatives developed with the local communities in pursuit of a harmonious and productive relationship with nature. This drive to rally the community resulted in the creation of Ampromatas – *Associação dos Amigos Protetores das Matas Simonesienses* (Association of the Friends and Protectors of the Forests of Simonésia), a local NGO and partner in the actions conducted in the region. In addition to promoting courses and lectures, *Biodiversitas* has also been encouraging people from neighbouring areas around Mata do Sossego to adopt more sustainable agricultural practices. Some of the main activities underway both inside the PNHR and in the surrounding region are programs to train farmers in the production and use of bio-fertilizers, environmental education and scientific research. The Mata do Sossego Private Natural Heritage Reserve has infrastructure for visitation and there are always researchers available to answer questions.

#### *Canudos Biological Station, Bahia*

The Canudos Biological Station was created in 1993 by *Fundação Biodiversitas* with the goal of protecting the Lear's macaw, one of the world's most endangered bird species. The station consists of 160 hectares of scrubland located in the Toca Velha region of the backwoods of Bahia. Belonging to the municipality of the same name, the Canudos Biological Station is of great cultural and historical importance. The sandstone canyons and cliffs, which serve as dormitory and nesting sites for Lear's macaw, lend impressive contours to the scrubland landscape. This region is key for the macaw's survival, as nearly 70% of the species' surviving individuals congregate there at a certain time of year. The Station has the basic infrastructure required for research and this is at the disposal of all who may be interested in developing projects on Lear's macaw, the Caatinga scrubland or any of its species



of flora and fauna. The most recent censuses show that macaw numbers have increased five-fold across its range of distribution since the creation of the Station.



Photo: Fundação Biodiversitas Collection

Canudos Biological Station.

### *Drafting protected area management plans*

The *SNUC – Sistema Nacional de Unidades de Conservação* (National System of Protected Areas) defines a Management Plan as “a technical document that – based on the general objectives of a protected area – establishes the zoning and norms that will regiment the area and the handling of its natural resources, including the implementation of the physical structures required for the management of the unit”. In the current context, the participation of internal and/or external stakeholders who have a relationship with the area is highly valued. We believe that this contribution is beneficial to the management of a protected area as it expands the base of partnerships and secures the commitment of other players in policing the unit and its surroundings, thus ensuring its protection.

In a further contribution to the conservation of Brazil's biodiversity, *Fundação Biodiversitas* drafted the Management Plan for the Serra do Rola Moça State Park in the environs of Belo Horizonte in Minas Gerais. The purpose of the Management Plan was to give the protected area the support needed to manage its natural resources. The Plan, which was drafted upon a mapping and analysis of the natural, physical and biotic resources and the existing or potential human interferences in the area, defined the zoning of the unit and identified the actions required for its proper management, handling and monitoring. The Plan also sought to lay the foundations for a more efficient management of environmental conservation inside the Park, reconciling it with its public usage in order to guarantee its long-term sustainability.

## Environmental planning

The identification of priority areas for conservation and territorial ordinance requires environmental planning methodologies.

Knowledge of the priority areas and actions for sustainable use conservation and the equitable sharing of the benefits derived from biodiversity is of fundamental assistance to environmental management. Faced with the shortage of information about what should be preserved as a matter of priority and how that should be done, one of the stiffest challenges for those responsible for reaching decisions is the definition of action plans for the conservation of biological heritage. In recent decades, various initiatives have led to the identification of global conservation priorities by considering rates of biological diversity, the degree of imminent threat, endemism, ecological representativeness, among other criteria.

One of the most interesting courses of action, and one that has yielded extremely important dividends for the conservation of biodiversity, is the series of workshops the federal government has held via Pronabio to define conservation priorities. With the objective of establishing directives for the protection of Brazil's biomes, five



workshops have already been held in partnership with non-governmental organizations (NGOs), researchers and technicians from management organs (MMA 2000).

The process for evaluating priority areas for conservation is based on four main premises: i) the importance of biodiversity as a fundamental element in planning and development strategy; ii) the species distribution pattern; iii) the existence of areas with high species diversity and a large number of endemic species; and iv) the fact that many of the areas that stand out for their wealth and abundance of species are severely threatened (Mittermeier et al, 1997 in Costa et al, 1998). In the light of these premises, *Fundação Biodiversitas*, in conjunction with other NGOs and universities, collaborated with the Ministry of the Environment in a bid to define priority areas for conservation in the following sets of biomes: Cerrado savannah and Pantanal wetlands, Atlantic Forest and Southern pastureland and the Caatinga scrubland.

#### *Producing the Atlas of Priority Areas for the Conservation of Biodiversity in the State of Minas Gerais*

Like many other Brazilian states and indeed countries around the world, one of the biggest challenges Minas Gerais faces is the promotion of the conservation of biodiversity in such a fragmented landscape. One of the first steps in this sense is to acquire knowledge of the biodiversity the territory contains, its distribution, endemism and conservation status. In order to do this, *Fundação Biodiversitas* and Conservation International adopted the same methodology applied in defining priority areas in Brazilian biomes for a similar definition in the State of Minas Gerais.

With the support of the State Environmental Secretariat, the scientific community and environmentalists, Minas Gerais became the pioneering state in the application of the workshop methodology to define biodiversity conservation priorities and the 1998 publication *Biodiversidade em Minas Gerais: Um Atlas para sua Conservação* (Biodiversity in Minas Gerais: An Atlas for its Conservation) and

its subsequent approval by Copam – *Conselho de Política Ambiental de Minas Gerais* (Minas Gerais Environmental Policy Council) – through Deliberative Norm 55 of June 2002, were the practical results of that. This legal measure made the Atlas an official base for the State's environmental licensing processes, such that undertakings in areas considered priority came to be subject to rigorous evaluation and can even be impeded depending on the degree of impact they would have on the local biodiversity.

In 2005, seven years later, *Fundação Biodiversitas*, in partnership with Conservation International – Brazil, Semad – *Secretaria de Meio Ambiente e Desenvolvimento Sustentável de Minas Gerais* (Secretariat for the Environment and Sustainable Development of the State of Minas Gerais), the IEF/MG – *Instituto Estadual de Florestas* (State Forestry Institute), the Igam/MG – *Instituto Mineiro de Gestão das Águas* (Minas Gerais Water Management Institute), Feam/MG – *Fundação Estadual de Meio Ambiente* (State Environmental Foundation) and Ibama – *Instituto Brasileiro de Meio Ambiente e Recursos Naturais Renováveis* (Brazilian Institute for the Environment and Renewable Natural Resources), with sponsorship from CVRD – *Companhia Vale do Rio Doce*, undertook the revision of this Atlas as stipulated in the Deliberative Norm that gave it official status. The expectation is that its application will acquire greater scope, guiding the state's economic expansion plans and reconciling the interests of the productive sectors, the need and opportunities for growth and the demands for conservation.

### *Serra do Espinhaço Biosphere Reserve*

Espinhaço is without doubt one of the richest and most diverse regions in the world. The area's vastness and biological, geo-morphological and historical importance justify the adoption of urgent measures for the conservation of the entire mountain complex.

In addition to its natural beauty, the region is lined by mountains that cradle such cultural patrimony as the historic cities of Ouro Preto, Mariana, Caeté, Santa Bárbara, Serro, Diamantina and a host

of artistic and religious manifestations that still live on throughout this extensive mountain range. Well-known tourist attractions like Ouro, Diamante, Cachaça, Estrada Real and the hundred year-old farms of Minas all either touch or are touched, in some way or other, by the Espinhaço mountain range.

With the aim of adopting a more efficient planning scale for the Espinhaço Mountains and of pursuing its recognition, *Fundação Biodiversitas* participated in the Working Group assembled by the Secretariat for the Environment and Sustainable Development of the State of Minas Gerais to draw up a proposal to have the region recognised as a Unesco Biosphere Reserve.

In June 2005 part of the Espinhaço Mountains was recognised as a Biosphere Reserve by Unesco's Man and the Biosphere Network. This constitutes a conservation benchmark for Brazil, as, besides protecting a highly relevant area, it is also a concrete action in the implementation of proposals for priority areas for conservation.



Photo: Luiz Cláudio/Fundação Biodiversitas

Tabuleiro Waterfall.

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# GAP analysis in the protection of biodiversity: a Brazilian perspective

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David C. Oren

## Introduction

The main intention behind the Protected Areas Programme of Work presented during the VII Conference of the Parties (COP-7) to the Convention on Biological Diversity (CBD) held in February 2004 in Kuala Lumpur, Malaysia, was to curb the loss of biological species by strengthening the system of protected areas in each signatory nation. The target encourages countries to form networks that are ecologically representative of the protected areas with a view towards protecting the entire spectrum of national biodiversity, though with special emphasis on endemic and endangered species.

The development of a representative system of protected areas depends much more on scientifically based approaches (equally biological and social sciences) than on random choices or decisions fundamentally grounded in political motives or mere convenience. As such, the CBD proposed that each country conduct a gap analysis to determine the extent to which their current systems manage to protect the national biodiversity and how they could be improved so as to meet the Convention's targets. The timeframe proposed represented a profound challenge in itself, as the deadline for completing the analyses is the end of December 2006. In theoretical terms, gap analyses are not particularly complicated. They involve mapping the current system of protected areas, mapping the elements of national

biodiversity and analysing which elements are already under protection and which remain to be protected. Once concentrating on what needs to be protected, the next step is to identify the existing options for completing the system of protected areas so as to encompass the entire range of biodiversity.

As a signatory of the CBD and, more importantly, of the National Implementation Strategy Partnership – NISP protocol drafted during the COP-7, Brazil has committed to adopting the suggestions presented by the conference for a three-prong approach to strengthening national systems of protected areas:

1. Gap analysis;
2. Development of long-term financial viability mechanisms; and
3. Proper training for the management of the system.

In this text we aim to take a look at what is “state-of-the-art” in protected area gap analysis with a view to offering suggestions to advance this process in Brazil.

## What does “gap analysis” mean?

In nature conservation, “gap analysis” means identifying elements of biodiversity (species and ecosystems) that are inadequately represented in the system of protected areas (Dudley & Parrish, 2005). What we recognise as gap analysis today originated in the 1980s (i.e., Game & Peterken, 1984; Diamond, 1985). Benchmarks in the advancement of the concept of gap analysis include the work of Pressey et al. (1993) and Margulis & Pressey (2000). For those interested in the details of protected area system planning we recommend Groves, excellent manual (2003). Gap analysis has grown in recent times both in geographic range and sophistication, principally through the development of a lot of new software, such as SPOT, MARXAN, among others (USGS, 2004), that makes it easier to choose the most “efficient” systems of protected areas. Many countries formally adopted gap

analysis in their biodiversity conservation planning from the 90s on, especially after signing up to the Convention on Biological Diversity. The commitment of each signatory nation to conduct protected area system gap analyses was formalised in item 1.1.5 of the COP-7 Programme of Work, which reads:

By 2006 complete protected area system gap analyses at national and regional levels based on the requirements for representative systems of protected areas that adequately conserve terrestrial, marine and inland water biodiversity and ecosystems. National plans should also be developed to provide interim measures to protect highly threatened or highly valued areas wherever this is necessary. Gap analyses should take into account Annex I of the Convention on Biological Diversity and other relevant criteria such as irreplaceability of target biodiversity components, minimum effective size and viability requirements, species migration requirements, integrity, ecological processes and ecosystem services.

It is important to highlight that gap analysis is only part of an ampler process. We do not have the space here to go into the Programme of Work in all of its detail beyond a treatment of gap analysis, but we encourage anyone who may be interested to access the complete text of the Protected Areas Programme of Work signed during the COP-7 at the following site: <http://www.biodiv.org/decisions/?dec=VII/28>.

## Steps in Gap Analysis

Gap analyses can either be extremely simple or involve various layers of complex computational data and analysis. This may require anything from a modest budget to elevated sums. Regardless of these factors, all gap analyses and plans for subsequent action involve the following basic steps:

1. Identify and map the biodiversity and existing protected areas;



2. Use this information to identify gaps<sup>12</sup> in biodiversity protection;
3. Prioritise the gaps that need filling;
4. Seek consensus on the strategies to be adopted and then draft concrete plans of action to fill those gaps.

*Identifying and mapping the biodiversity and existing protected areas*

Mapping the protected areas is the most direct and certainly the easiest aspect of this step. As for the biodiversity, the volume of information available for this step varies greatly from country to country. The ideal case would be to gather current information from all reliable sources and plan the collation of new data when possible in terms of time, money or human resources. When this is not possible, a good option is to work with a few groups of relatively well-known organisms (for example, palm trees, economically important plants, birds, mammals and certain other vertebrate groups, such as lizards) and supplement this with mappings of special environments and the chief ecosystems, which will contain the vast majority of less well-known species. Although it is possible to do the mapping manually, the use of GIS – Geographic Information System becomes indispensable if complex data is to be integrated. An ideal analysis would cover aquatic and marine ecosystems and species as well as the terrestrial.

The biodiversity information used can be of various types and scales, varying from “coarse filter” (ecosystems) to “fine filter” (biological communities and species) (see Groves et al., 2000). The roughest analysis might only include biomes: are all of the biomes adequately protected? In little known systems, such as marine systems, this might currently be the only viable option. In terrestrial and aquatic systems,

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12. Gaps in biodiversity protection cover can be broken down into three main categories:  
 – Absolute gaps. When a given species or habitat has no protection whatsoever;  
 – Gaps in ecological integrity. When there is some protection, but in areas either too small or too degraded for the biodiversity to be viable in the long term;  
 – Operational gaps. A protected area exists, but is lacking in one or more critical management aspects to be able to guarantee the integrity of a given species or ecosystem.  
 (from Dudley & Parrish, op. cit.)

however, more detailed analyses are normally possible, including ecosystems, types of vegetation and some relatively well-known groups of species.

### *Using the information to identify gaps*

The gaps (which ideally ought to include all three types: absolute, viability and operational) can be compared in two distinct ways. One approach is to make a direct comparison between existing species and ecosystems and the current system of protected areas. The other way is to use the data to identify areas particularly rich in biodiversity and compare these against the existing system of protected areas.

### *Prioritising the gaps that need filling*

Gap analysis in itself, from a purely technical/scientific perspective, can be considered complete after the first two steps. However, further analysis is essential in order to identify which gaps most urgently need to be filled. This requires the analysis of threats to biodiversity, opportunities for action and of capacity for implementation, both in terms of financial and human resources, as well as analysis of socioeconomic and political aspects.

### *Seeking consensus on the strategies to be adopted and drafting concrete plans of action*

There are many ways to complete a system of protected areas. The categories of protection can vary from strict use to the most diverse levels of human activity compatible with the maintenance of biodiversity components. The options and opportunities afforded by the local reality, however, serve as the backdrop against which the decision will be taken as to which strategies are most appropriate in terms of achieving the conservation goals indicated by the gap analysis and subsequent concrete actions towards a system of protected areas that embraces the biodiversity of the nation in its entirety.



According to Dudley & Parrish (op. cit.) “Conducting gap analysis fulfils a short-term commitment of the CBD. More important, however, is that the analysis should provide essential information upon which to base the best decisions on conservation strategies and create an important opportunity to involve stakeholders from all over the country in discussions on the need for new protected areas, where they ought to be established and how they should be managed”.

The first three steps are essentially technical exercises, but the fourth also involves contributions from the political, social and economic spheres. For this reason, it is important to engage the most diverse sectors from the very outset of the gap analysis in order to facilitate a final consensus.

## Guiding principles for conducting gap analysis

Gap analysis is not an exercise that follows a given recipe. At the same time, regardless of the details of the methodology used, a series of scientific, social and political principles ought to guide it as it unfolds (Dudley & Parrish, 2005). These include: representativeness, redundancy, resilience, respect for different types of gap, a participative approach and an iterative process.

*Representativeness:* guarantees that all of the biodiversity is included. Naturally, for practical reasons, protected areas may occupy only part of a given landscape. The fundamental point for efficient gap analysis is that the protected areas be situated in places where they can include the maximum possible biodiversity. The commitment to including the entire spectrum of biodiversity, as established in the Programme of Work, implies the need to have samples of all of the ecosystems and species represented in the system of protected areas in sufficient numbers or volume to ensure long-term survival.

*Redundancy:* means having sufficient examples of any given ecosystem such that the unexpected loss of one or other will not

compromise the target. "Keeping all your eggs in one basket", or even "keeping each egg in its own basket" means the samples will almost certainly not withstand all direct and indirect human pressures (such as climate change) and catastrophic events, such as earthquakes, tsunamis and prolonged drought. As such, it is important to build a system of protected areas that contains, wherever possible, more than one sample of each representative element of the biodiversity.

*Resilience:* the capacity to endure strain and change. In principle, resilience involves maintaining and restoring viable ecosystems. Very small protected areas surrounded by highly degraded tracts of land will stand little chance of maintaining their biodiversity in the medium to long term and, with the advent of global climate change, this problem is exacerbated. The ideal would be to select large areas with environmental gradients, such as altitude or precipitation, which present the possibility of accommodating the biodiversity in the ideal conditions for surviving change. Where there are only small protected areas, the creation of corridors and the restoration of surrounding degraded areas are alternatives that offer the best resilience.

*Different types of gap:* this means considering absolute gaps, gaps in ecological integrity and operational gaps in every gap analysis. Each of these gap types must be considered, as a different strategy will be required to fill each one.

*Participative approach:* this means promoting collaboration amongst different stakeholders in participating in decisions concerning protected areas. The scientific side to the analysis needs to be couched in a series of values, which include the interests of the nearby communities most directly affected. The CBD stipulates the need for participation of interested parties in the selection of protected areas, including indigenous peoples and traditional communities. The main purpose of gap analysis is to use scientific criteria to guide the decisions most central to the conservation of biodiversity, but the final decisions need to integrate the scientific part with the political and

economic reality, with the need to act quickly and with the opportunities that exist.

*Iterative process:* Gap analysis is only the beginning of a process. Even if a gap analysis is based on the best possible information available at the time, its results should never be taken as “the last word”. It is fundamental to understand that the analysis has to be reviewed periodically as new information comes available or as environmental conditions change. Even if the COP-7 sets out gap analysis as a specific target with its own tight deadline, it is important to point out that the results of each national gap analysis can be improved over time. As such, gap analysis should not be viewed as an end in itself, but as the beginning of a process that will be revised and improved as new information is produced.

## Gap analysis in Brazil

### *History*

From 1998 to 2000, the Ministry of the Environment of the Brazilian Government promoted a series of five workshops as part of Probio – Project for the Conservation and Sustainable Use of Biological Diversity, supported by the World Bank and GEF – Global Environment Fund. The goals of the workshops included identifying priority areas and courses of action for the conservation of Brazilian biodiversity throughout seven biomes: Cerrado scrubland, Pantanal wetland, Atlantic Forest, Southern pasture, Caatinga brush, Amazon Rainforest and the Coastal and Marine Zone. Hundreds of the most renowned specialists in biodiversity in the country participated in these events. Although the methodology used at the workshops did not specifically include gap analysis, the results obtained represented a national consensus at the time as to the most important areas for biodiversity conservation and sustainable development in Brazil (MMA, 2002). Oren and Matsumoto (2005) analysed the workshops’ results

ecoregion by ecoregion in order to determine threat levels, biological representativeness (based on the IBGE vegetation types) and level of protection (using the categories of strict use, sustainable use and indigenous reserves) for each region in Brazil and each Probio polygon. This CD-ROM could be useful in gap analysis work in Brazil, as it includes data on the current system of protected areas and its extension and representativeness. For example, it indicates that 44.88% of the Guiana Rainforest ecoregion is already under a strict use protection regime; even so, one of the three IBGE vegetation types in the ecoregion (Savannah Steppe Park) was not represented in any of the strict use protected areas. In contrast to the immense area of Guiana Rainforest under protection (albeit with a gap in representativeness on the level of vegetation), only 0.29% of the Southern Pasture ecoregion is under strict use protection and only one of the ten IBGE vegetation types is represented. The challenges faced and strategies needed in filling the gaps in these two regions will clearly be very different.

### *Ecoregional assessments and gap analysis in Brazil*

There have been at least two concrete gap analysis experiences in Brazil in recent times. In fact, the so-called "Ecoregional Assessments", in which planning for specific ecoregions analyses the components of biodiversity in order to guarantee long-term conservation, could also contribute to gap analyses, as they include information on biodiversity, as well as on threats, opportunities and strategies. Examples of recent ecoregional assessments on areas of Brazil include Southwestern Amazon (WWF, 2003), Inland Forests of Paraná/Paraguay (WWF, 2004) and Gran Chaco Americano (TNC et al., 2005).

In 2004 Conservation International-Brazil and the World Wildlife Fund-Brazil were contracted by the Environmental Agency of the State of Goiás to conduct gap analysis for the protection of the state's biodiversity and with a view to creating new state-run conservation units. The Ministry of the Environment is currently coordinating a group that includes the Brazilian branches of CI, WWF and TNC

conducting gap analysis in the Amazonian part of Mato Grosso in order to identify priority areas for new conservation units in the north of the state. This shows that the government has joined civil society in recognising the practical utility of the tool.

### Conclusions

Brazil has shown real global leadership in biodiversity conservation initiatives, as was illustrated by its hosting of the first United Nations convention on biodiversity in 1992, universally known as Rio-92, and has since continued at the vanguard of nations taking their responsibilities towards biological diversity seriously through efforts like the Probio workshops and its signing of the NISP at the COP-7. This track record, which befits a country with the richest biodiversity in the world, is proof that Brazil has developed the competency, experience and motivation to conduct a most exemplary gap analysis for the protection of biodiversity.

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# The contribution of the Golden Lion Tamarin Association in the implementation of Article 8 of the Convention on Biological Diversity

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Denise Marçal Rambaldi<sup>13</sup>

In-situ conservation of biodiversity is defined by the Convention on Biological Diversity (CBD) as the conservation of ecosystems and habitats and the maintenance and rehabilitation of viable populations of species in their natural surroundings and, in the case of domesticated or specially reared species, in the surroundings in which they developed their characteristic properties.

The in-situ conservation efforts that have been underway for more than two decades to recover and conserve the golden lion tamarin (*Leontopithecus rosalia*) in its natural habitat, an endangered primate species endemic to the Atlantic Forest and Coastal lowlands of Rio de Janeiro State, are an appropriate illustration of the impact of integrated and complementary action on the part of non-governmental institutions and government agencies in the implementation of Article 8 of the CBD, which deals specifically with in-situ conservation.

The Golden Lion Tamarin Conservation Program was established in the 1980s with the cooperation of the IBDF – *Instituto Brasileiro de Desenvolvimento Florestal* (Brazilian Forest Development Institute) (now Ibama), Feema – *Fundação Estadual de Engenharia do Meio Ambiente do Rio de Janeiro* (Foundation for Environmental Engineering of the State of Rio de Janeiro) and the Washington National Zoo with the objective of establishing and implementing

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13. General Secretary of the *Associação Mico-Leão-Dourado* – [www.micoleao.org.br](http://www.micoleao.org.br).

an in-situ conservation strategy for the species, thereby increasing its chances of long-term survival. This strategy was to complement the cooperative and international efforts for the ex-situ conservation of the species undertaken in the mid-70s by these same institutions.

Conducted by researchers and educators in strict cooperation with public agents, the Golden Lion Tamarin Conservation Program grew into independence with the creation, in 1992, of the AMLD – *Associação Mico-Leão-Dourado* (Golden Lion Tamarin Association), a private, non-profit organization with a suitably qualified professional staff and socially constituted by scholars in biological conservation, rural landowners, conservationists, public agents, businesspeople, community leaders, teachers and other representatives of the local society. The AMLD's mission is to promote the conservation of the biodiversity of the Atlantic Forest with special emphasis on the protection of the golden lion tamarin in its natural habitat. Its conservation target for 2025 is to reach the minimum viable population of 2,000 genetically connected golden lion tamarins living freely on 25,000 hectares of protected forests consolidated as a landscape unit.

Reaching this target presents a stiff challenge. The catchment basin of the São João River is home to the last remaining tamarin populations and extends across eight different municipalities. The landscape of the region has been altered by the intense human intervention brought about by various economic activities that require the lumbering of wood for use in the coal and ceramics industries, as well as the cultivation of sugar cane, coffee and citric fruits and, most predominantly of all today, cattle ranching and subsistence agriculture. The sustainability of the rich and unique biodiversity of the few remaining tracts of forest is strictly related to the processes and dynamics intrinsic to the persistence of small populations in fragmented landscapes and to current decisions concerning the use of the basin's soil.

Whether public or private, conservation units are the most effective tools for conserving biodiversity. The CUs already established in the region – the Poço das Antas Biological Reserve, the first created in Brazil, as far back as 1974, and the Union Biological Reserve, 1998,

are not representative of the regional biodiversity, nor do they span enough territory to ensure the survival of viable populations of lion tamarins and other species. For this reason, the AMLD's activities reach beyond the borders of the CUs into the surrounding private lands, considered essential to the ecological restoration of the landscape of the São João river basin, where the use and division of the land into lots has been subject to regulation since the creation of the São João River/Golden Lion Tamarin Area for Environmental Protection in 2002, covering approximately 150 thousand hectares, and by the Municipal Master Plans.

In this context of soil use, the degradation of forest cover and water resources and the uncontrolled expansion of urban zones, particularly in the coastal region of the basin, society's effective integration and participation in conservation planning and actions has been and continues to be the key to achieving the long-term political/social commitment and support needed to obtain meaningful results in the restoration, protection and conservation of Atlantic Forest biodiversity.

The AMLD strategy rests upon science applied to species and habitat conservation biology and the acquisition of knowledge concerning the social and economic dynamic of the region, and focuses upon the following:

- Identification of priority areas for the conservation of the biodiversity of the São João river basin;
- Support for the creation and implementation of public and private Conservation Units;
- Ecological restoration of the landscape through the implementation of forest corridors; the restoration of ciliary forests and springs;
- Research and monitoring applied to the management of the metapopulation of golden lion tamarins developed with the use of translocation, reintroduction, controlled dispersion and other techniques;
- Identification of invading species and management proposals for the control and prevention of new biological invasions affecting the basin;

- Participation in the process of formulating and implementing public policy on the conservation of biodiversity;
- Sensitising regional communities as to the importance, need for and legality of the conservation of the basin's unique Atlantic Forest biodiversity;
- Joint construction and recovery of local knowledge and capacity for the adoption of economic alternatives compatible with the conservation of biodiversity, such as ecotourism, agroecology, arts and crafts, etc.
- Training in conservation biology for students and professionals;
- Multi-institutional and multi-disciplinary cooperation;
- Dissemination of its actions, results and impacts amongst the lay and scientific communities

The most expressive results and impacts obtained over 22 years of uninterrupted in-situ conservation can be summarized as follows:

- An increase in the golden lion tamarin population from 150 individuals in the mid-1970s to 1,200 in 2004;
- Continuous management and monitoring of 70% of the population in the wild since 1983;
- Increase of 65% in the area covered by strict use Conservation Units in the São João river basin;
- Creation of 17 PNHRS (Private Natural Heritage Reserves) in the basin with direct support from the AMLD and the creation of a further 17 areas at different phases of the certification process, together providing permanent protection for more than 5 thousand hectares of forest;
- Effective, long-term involvement on more than 100 rural properties in the protection, management and ecological restoration of the landscape;
- Establishment of the *Associação Mico-Leão-Dourado* (Golden Lion Tamarin Association) – a Brazilian institution that has achieved national and international recognition – for the development and implementation of conservation strategy;

- More than 200 national and international scientific publications;
- More than 250 students and professionals trained in conservation biology;
- Hundreds of reports, articles and documentaries featured in and broadcast by various media groups throughout Brazil and the world (Globo, Cultura, Bandeirantes, BBC, National Geographic, Discovery, NHK, Animal Planet, and others);
- Annual creation of approximately 30 direct and full-time jobs;
- At least 30% of the rural properties in the municipality of Silva Jardim switched their main economic activity from cattle raising to ecotourism;
- People from the local communities trained by AMLD currently hold such senior positions as leaders, decision makers and implementers of public environmental policy;
- This performance has had impact throughout the entire region, with the result that the communities now put more store on their natural environments in the interests of their own well-being;
- The golden lion tamarin was the animal Brazilians chose to feature on the new 20 real banknote;
- The Golden Lion Tamarin Conservation Program is a world-wide model and reference for the conservation of endangered species and habitats, thus showing the importance of an integrated approach at landscape level;
- The local communities are recovering their culture and history, improving their income, quality of life and self-esteem by integrating conservation and ecotourism;
- The golden lion tamarin is globally recognized as the symbol for the conservation of the Atlantic Forest;
- The golden lion tamarin is the first primate species to improve its ranking on the IUCN – World Conservation Union listing, moving up from critically endangered to endangered in 2003.



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# *Grande Sertão Veredas* National Park – A government/civil society co-management experience

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Cesar Victor do Espírito Santo

From 1987 to 1988 the Pro-Nature Foundation (Funatura), with the support of the then Special Secretary for the Environment (Sema) and the World Wildlife Fund (WWF), conducted a series of studies in Gerais (a sub-unit of the Cerrado scrubland), a region encompassing the Northeast of Minas Gerais, Western Bahia and Southern Piauí states, with a view towards creating Conservation Units. Of the nine areas studied, two were considered high priority, one in Bahia and the other in Minas Gerais. In the case of the Bahia site, the study recommended the creation of an Ecological Station that was never actually implemented, while a National Park was suggested for the site in Minas Gerais. This area, still well preserved and extremely rich in biodiversity, water resources and landscapes, not to mention in socio-cultural terms as well, was facing a severe threat from the coal mining underway in the Cerrado and the arrival of the large-scale monocultivation of soy and eucalyptus.

In 1989, with the conclusion of the Funatura studies and the drafting of documents arguing the relevance and importance of conserving the area, a decree was given for the creation of the Grande Sertão Veredas National Park on an area of approximately 84,000 hectares of land. In May 2004, by an additional Presidential decree, the Park was enlarged to 231,000 hectares, with most of this land belonging to the state of Bahia. The participation of civil society, under the coordination of Funatura, was fundamental on



this occasion in exercising significant influence on the government's decision to expand the Park.

The Park takes its name from the famous novel by Guimarães Rosa, published in 1956, entitled *Grande Sertão: Veredas*, in which the author describes the natural environments in which the Park is now located. Various passages in the book speak of real places and socio-cultural characteristics that can still be encountered there today.

Since its creation, Funaturá and Ibama have celebrated various agreements for the co-management of the Park and the execution of activities related to its implementation.

Ibama allocated a skeleton staff that included the Park warden and installed and equipped the Headquarters at Chapada Gaúcha (the city closest to the Park), as well as other actions, such as demarcating the unit's frontiers; initiating the agrarian regularization by appropriating farms and compensating their owners; and hiring, on a temporary basis, a team of fire-fighters to prevent and control fires. Ibama also recently issued an edict to create an Advisory Council for the Park.

Complementing the activities of Ibama, Funatura works with the region's communities and in the protection of the Park. Its staff includes technicians with university degrees and secondary education diplomas and members of the local communities, who work as park wardens.



To finance its activities, Funatura raises funds from various institutions. Initially supported by the WWF, the institution has since established a partnership with The Nature Conservancy (TNC). The main TNC-funded project, begun in 1993, avails of a mechanism whereby external debt is converted into environmental funding valid for use within a twenty-year timeframe. With the support of the Japanese Embassy, the Park was able to implement a project for the prevention and combat of fires, while Pathfinder International financed the execution of a health and environment project. In conjunction with Ibama, Funatura drafted the Management Plan for the Park with support from *Fundação O Boticário de Proteção à Natureza* – FBPN (O Boticário Foundation for the Protection of Nature), TNC and Ibama itself, and, with the help of the *Instituto Estadual de Floresta de Minas Gerais* (State Forestry Institute of Minas Gerais), the Management Plan for the Serra das Araras State Park, a conservation unit that serves as an ecological corridor to the National Park. In addition to this, Funatura has drawn upon the support of Probio/MMA (Project for the Conservation and Sustainable Use of Biological Diversity/Ministry of the Environment) to undertake the sustainable development project in the environs of the Park, which will be followed up with a technical assistance project sponsored by FNMA/MMA/MDA (National Environment Fund/Ministry of the Environment/Ministry of Agrarian Development) and the implementation of Private Natural Heritage Reserves in the surroundings with funding from the Global Environment Facility and United Nations Development Program.

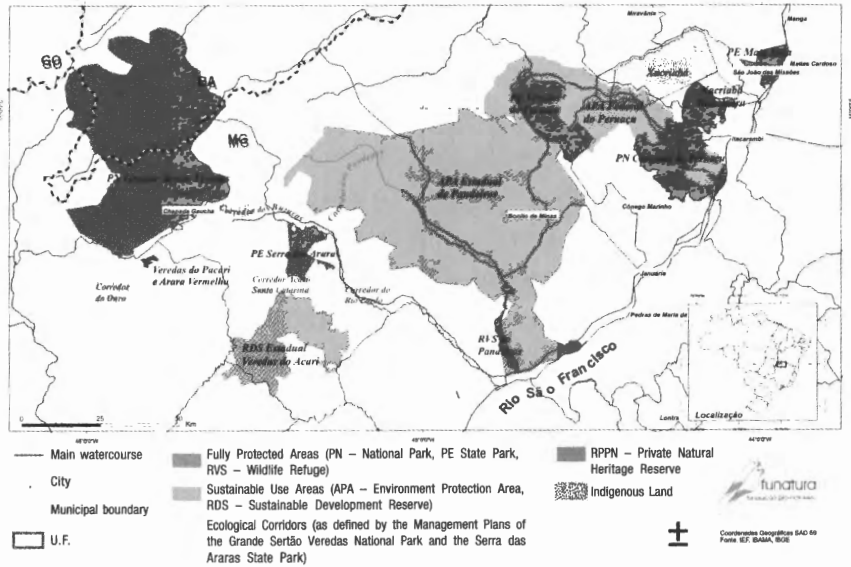
The main focus of Funatura's activities involves working alongside the region's communities on actions targeting the sustainable development of the Park's surroundings, with special emphasis on agro-extractivism, agro-ecology and eco-cultural tourism. The purpose of the work is to support incentives compatible with the preservation of the Park that can bring returns for the families involved. To this end, the surrounding communities have been offered technical assistance and various skills-training courses in the above-mentioned fields. In addition to this, Funatura supports the improvement and commercialisation of certain extractivist products (*fava-danta Dimor*

*phandra mollis*, jelly palm straw *Butia capitata*, Moriche palm straw and fruits *Mauritia flexuosa*, caryocar nuts *Cariocar coriaceum*) and agricultural products (cassava flour, raw brown sugar, brown sugar and honey). The idea behind the eco-cultural tourism activities is to prepare the local communities to receive tourists. This preparation includes tour-guide and storytelling courses and the development of tourist itineraries for the most promising areas surrounding the Park. In function of this work with the communities, Funatura created the Meeting of the Peoples of Grande Sertão Veredas, an event held annually in the town of Chapada Gaúcha and fully absorbed by the Municipal government and the communities. The purpose of the event is to promote healthy fraternization among the peoples of the region and includes a products fair, cultural presentations and an exchange of experiences.

In an unprecedented undertaking anywhere in the country, Funatura served as a mediator between a community living inside the Park and the official organs (Ibama and Incra) in order to resolve the predicament of these families in the face of the prevailing legislation, which did not permit their presence there. The chief concern was to find an alternative area for these families that could offer similar



### Conservation Units Sertão Veredas – Peruaçu



conditions to those they were used to inside the Park. The main criteria required finding somewhere in the same municipality with similar soil type, water, vegetation and landscape. The farm finally chosen by the community met all of the pre-requisites. Another important point worth highlighting is the preservation of this community's structure and organization. Care was taken to ensure that the same family ties, comradeship and neighbourliness were maintained at the new Settlement. In other words, the situation as encountered inside the Park was respected and reproduced at the Settlement. The planning process was no less important. The Settlement Development Plan was drafted in a participative manner under the charge of the University of Brasília Work Group for the Support of Agrarian Reform, in partnership with the Viçosa Federal University and supported by Funatura and Inbra. The Settlement is currently in its implementation phase, with the construction of the residences and preparation of the plots, which have yielded positive results in terms of the farming and rational extractivist harvesting of Cerrado produce. The community is

in the process of organizing and gradually consolidating its own association. With support from Iphan (National Historical and Artistic Heritage Institute) and in conjunction with the community, an inventory is being taken to ascertain the Settlement's non-material patrimony.

As a strategy to work the region around the Park in an ampler fashion, Funatura has been taking steps towards the eventual formation of a large Ecological Corridor that would in fact result in a mosaic of conservation units covering an area of approximately one million hectares, stretching from the Grande Sertão Veredas National Park to the Peruaçu Caves National Park, passing through various Protected Areas, State Parks, Sustainable Development Reserves, Wildlife Reserves and Private Natural Heritage Sites. The idea behind this drive is to enable the region to develop upon truly sustainable foundations, striking a balance among the social, economic and environmental factors.

Though much remains to be done on the implementation of the Park, this experience in co-management shows the gamut of possibilities that can arise from partnership between the government and a civil society organization. At a time when public authorities have such a limited capacity for action in terms of conservation and the sustainable use of biodiversity, the definition of public policies that facilitate the expansion and strengthening of such partnerships is fundamental if we are to meet the targets set by the Convention on Biological Diversity.

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# Building participative biodiversity management in the lower Rio Negro

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Carlos César Durigan and Sérgio Henrique Borges – *Fundação Vitória Amazônica*

Based upon an institutional decision to concentrate its activities in the Rio Negro basin in the state of Amazonas, Brazil, the FVA – *Fundação Vitória Amazônica* (The Amazonian Victory Foundation) prioritises the in-situ conservation of biodiversity through actions based on knowledge of the region's biodiversity, sociodiversity and use of natural resources. The implementation strategies for these efforts involve interaction with local social groups and administrative organs in the construction of shared forms of management for the conservation units (CUs) installed in the region.

The creation of CUs on the Rio Negro (and, indeed, all throughout the Amazon) from the 80s on, couched in the prevailing legislation of the day, failed to consider the human presence of indigenous and non-indigenous social groups, thus generating historic and abiding problems with which public organs and civil society groups have grappled ever since in search of solutions.

Much of the lower Rio Negro region, including the municipalities of Novo Airão and Barcelos, is occupied by conservation units. Chief amongst these are the Jaú National Park (2,272,000 hectares), the Anavilhanas Ecological Station (350,000 hectares), the Serra do Araçá State Park (1,818,700 hectares) and the northern and southern sectors of the Rio Negro State Park (303,835 hectares).

The fact that Strict Use Conservation Units occupy large tracts of the lower Rio Negro region has rendered illegal the presence of



many families who have lived there for generations. This makes it essential to implement social inclusion and development actions based on a model that can marry the generation of income with conservation. To achieve this, formal space must be allocated for the sustainable exploitation of the natural resources supplied by the region's biodiversity and for the continuation of the local livelihoods and cultures. Significant advances have been made in this direction with the establishment of Snuc – *Sistema Nacional de Unidades de Conservação* (National System of Conservation Units), the consolidation of which received substantial support from civil society. This advance has had important effects on the lower Rio Negro, where the discussion concerning the participation of local groups (e.g.: on advisory councils, in public consultations, etc.) in the process of creating and implementing CUs is already well underway.

Many actions in conservation planning are being implanted in this sector of the Amazon with the active participation of civil society, such as the Ecological Corridors Program, the Amazon Region Protected Areas Program (Arpa) and the Central Amazon Conservation Complex, a vast Natural Heritage site recognized by Unesco. However, there remain numerous possibilities for institutional interaction in this sector that could serve to broaden the scope for biodiversity conservation in the Rio Negro basin in a synergetic manner through entities already established there and that have for some time sought to build a network of positive interaction. A more positive relationship with public authorities has also been established, with the renewal of such organs as Ibama – *Instituto Brasileiro de Meio Ambiente e Recursos Naturais Renováveis* (Brazilian Institute for the Environment and Renewable Natural Resources) and Ipaam – *Instituto de Proteção Ambiental do Amazonas* (Amazon Environmental Protection Institute), which now seek a more active role in the participative consolidation of the federal and state-run CUs.

As a result, there is a growing mobilization of players involved in the construction of management mechanisms. CU Management Plans have been drafted with the effective participation of organized civil society through technical cooperation agreements with managing



organs. CU Managing Councils (both Advisory and Deliberative) are also in the process of being convened, which should be an important step towards defining the regional agrarian issue, which, given its slim prospects for a solution in the short term, is certainly the biggest problem of the region.

The technical cooperation agreements FVA has signed with Ibama and Ipaam are examples of interaction between organized civil society and public authority in the Rio Negro basin. In the case of the former, FVA has been providing technical support on the development of the programs outlined in the Jaú National Park Management Plan, with emphasis on the execution of the research program, biodiversity monitoring and participative management through the installation of its Advisory Council. The effective implementation of a Jaú National Park knowledge program, the methodology for which was created by FVA, ought to contribute significantly to an understanding of the natural and human phenomena that determine the distribution of biodiversity over large areas. More recently, FVA has been developing a technical partnership with Ipaam that envisages the drafting of a management plan for the northern sector of the Rio Negro State Park.

One important aspect of this interaction between public authorities and civil society has been the advances made on the issue of territorial ordinance through actions to achieve greater balance within the mosaic of existing protected areas in the lower Rio Negro, that is, to establish a strategy to allocate areas for the consolidation of Sustainable Use CUs to complement those set aside for Strict Use. The first result of this joint effort has been the implementation process for the Rio Unini Extractive Reserve, secured by the Rio Unini Residents' Association – Amoru on behalf of the riverside communities, which promises to be an important step in the search for balance between the two categories of CU established in the region.

As a complement to the actions focused on the CUs, there has also been on-going capacity building with local groups, strengthening them within the context of the projects underway in the region. One important network, Maquira-Rona (Novo Airão Organizations Network), has been a strong lobbyist with public authorities on all levels in the

drive for an agenda focused on the adequate use of the region's natural resources and the development of sustainable economic alternatives.

In this light, we believe that the lower Rio Negro basin constitutes an extremely positive scenario in virtue of the intense interaction between civil society, local organizations and public authorities in the creation and implementation of strategies for the in-situ conservation of regional biodiversity.

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# *Serra das Almas* Nature Reserve – Building a model for the conservation of the Caatinga scrub

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Rodrigo Castro, Philip Reed, Marcela Saldanha,  
Flávia do Prado, Maria Valnete Ferreira and Marcelo Oliveira

The Caatinga scrubland is an exclusively Brazilian biome covering almost 10% of national territory that is currently suffering under intense human pressure in the form of slash-and-burn practices, deforestation and hunting, leading to the fragmentation and reduction of its habitats. For a long time the Caatinga was mistakenly treated as an environment of little biological richness. However, when compared with other semi-arid regions throughout the world, the Caatinga presents a high degree of biological diversity and high rates of endemism, with an estimated minimum of 40% of identified flora species being endemic to the biome.

As the Caatinga is one of the Brazilian biomes most heavily altered by human activity, there have been no systematic surveys as to the evolution of its vegetal cover over time. An estimated 45% of the biome's total area has been altered, which makes it the third most modified Brazilian biome in terms of human impact, surpassed only by the Atlantic Forest and Cerrado. Nevertheless, besides the level of alteration, if we consider that only 1% of the biome is legally protected under strict use conservation units, Caatinga assumes the position of the least protected Brazilian biome.

The Caatinga Association, founded in 1998 with the goal of contributing to a reversal of the degradation of the Caatinga, is a non-governmental, non-profit organization whose mission is to conserve the biological diversity of the Caatinga scrub. In order to fulfil this

mission it runs a set of complementary projects in the areas of research support, the creation and management of protected areas, socio-environmental education and development. In that same year the American businessman and environmentalist Samuel Johnson made a financial donation as a gesture of his gratitude to the Caatinga and state of Ceará, the cradle of the carnaúba (wax palm), for the palm wax and riches his company had extracted down through the years. In conjunction with the international conservationist NGO The Nature Conservancy, this donation was used to create a Caatinga conservation fund.

Through surveys conducted to identify priority areas for the conservation of Caatinga scrub in Ceará, based on a range of ecological criteria, including level of conservation and the imminence of the threat of degradation, tracts of land were selected and acquired for the creation of the Serra das Almas Private Natural Heritage Reserve in the municipality of Crateús in the savannah of Inhamuns. The Caatinga Association relied on the support of The Nature Conservancy-Brazil and financial resources from the above-mentioned fund in conducting the area studies and acquiring the land. The Reserve Management Plan was drafted on the back of various preliminary studies and has been in operation since 2002, prioritising the following areas of activity: in-situ conservation of flora and fauna; development of a flora and fauna research program; recovery of degraded areas; creation of an agroecological belt around the Reserve; the creation of a local sustainable development plan for the surrounding area; visitation and environmental education. The Caatinga Association works from a vision that prioritises conservation efforts in the area, while promoting, at the same time, a relationship network with the neighbouring communities. In this sense, the protected area functions as an instrument of awareness that integrates the area in terms of the local socioenvironmental context, developing its potential to bring tangible improvements to the region. Improvements in quality of life the surrounding communities recognise as having been influenced by the Reserve will later serve to strengthen the partnership with those communities in conserving the Serra das Almas Nature Reserve.

The set of integrated and complementary actions the Caatinga Association undertakes in this regard represents the institution's effort to build a development model for the conservation of the Caatinga scrub.

Various projects currently function in an integrated manner inside the Reserve and in the surrounding areas with the objective of enhancing results and securing the success of the proposed strategies. The Caatinga Association works towards building a partnership network comprised of universities, technical and financial organs, rural landowners and small farmers, businesspeople, third sector organizations and government institutions, that can contribute to the conservation of Caatinga biodiversity.

Advances in the consolidation of the model under construction have been achieved thanks to the adherence of new partners and projects in recent years. The projects and partners involved in this construction are: *Fundação O Boticário de Proteção a Natureza* (O Boticário Foundation for the Protection of Nature), *Instituto Unibanco* (Unibanco Institute) and the *Natureza Jovem* (Young Nature) groups, working on environmental education actions with teachers and youngsters from the surrounding districts; The Nature Conservancy and Funbio, engaged in the implementation of the Management Plan for the Reserve and its surroundings; Probio/Ministry of Health and the Federal University of Ceará, working on Caatinga biodiversity research projects; Embrapa-Caprinos, Ministry of Agriculture, *Associação Comunitária de Queimadas* (Scorched Earth Community Association) and *Associação de Produtores do Assentamento Xavier* (Xavier Settlement Association of Rural Producers), developing agro-forest management alternatives for the Caatinga alongside the farming families in the vicinity of the Reserve.

In addition to the creation and conservation of protected areas in the Caatinga scrub, the Caatinga Association also runs complementary actions designed to promote the riches and problems of the Caatinga biome and the Association's experiences in trying to preserve it, with the objective of sensitising the public, drawing attention to the biome's value and emphasising the importance of its preservation. This effort involves periodically publishing articles, special pullouts

in newspapers, books and even a travelling exhibition entitled "The Surprising World of the Caatinga: Threatened Nature". This promotional drive also aims at attracting more researchers to the biome with a view to securing higher levels of conservation and contributing to the development and implementation of new conservation strategies. The Caatinga Association also works towards strengthening conservation on private lands throughout the country and in the Caatinga in particular through its support for the Association of Owners of PNHRS (Private Natural Heritage Reserves) of Ceará, Piauí and Maranhão-Asa Branca and the National PNHRC Confederation.

The Serra das Almas Nature Reserve has been recognised for its integrated approach to conservation and was recently selected by the *Comitê Estadual da Reserva da Biosfera da Caatinga do Ceará* (State Committee of the Caatinga Biosphere Reserve of Ceará) to become its first Caatinga Biosphere Reserve Advanced Post. In April 2005, with the purpose of ensuring the long-term maintenance of the Reserve and drawing up a sustainability strategy for the Conservation Unit, the Caatinga Association launched its "Adopt a Hectare in the Serra das Almas Nature Reserve" campaign. The idea of this campaign is to mobilise companies and individuals to contribute to the future preservation of the area, as one of the greatest challenges to in-situ conservation is the availability of financial resources to protect the conservation units.

The current positive results and consequences of the conservation model under construction has shown that initiatives to engage neighbouring communities have contributed in a practical way to reducing the degenerative pressure to which the region has been subjected. The more the local communities have learned about the Caatinga Association's work and come to recognise its importance, the more new allies have been identified who are now making their own concrete contributions to the conservation of the area. The creation of an adequate structure for visitation at the Reserve, with the construction of a visitor's centre, ecological trails and seedling nursery, has enabled us to develop frequent activities for this public, thus helping to produce greater integration between the protected area and the neighbouring communities.



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# Sesc Pantanal: sustainable development

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Nivaldo da Costa Pereira

Up to the end of the last century extensive cattle raising was the driving force of the economy of the regions located in the Pantanal wetland of Mato Grosso. Against a backdrop of cyclical floodplains, dazzling natural scenery was topped off with the classic image of the cowhand carrying his bullhorn, the scripted imagery of a socio-cultural reality whose moulds were the fences of large ranches and the green of the rolling pastures. Exhausted as a productive model, extensive cattle raising could not withstand the rural modernity, the economy of scale, and lost ground to innovative management formats, such as confined fattening, which obtains better results in less time and dispenses with the need for vast tracts of land. A circle was closing, giving way to new economic alternatives that were emerging somewhat chaotically. Following upon earlier examples, they brought the wetlands as their base, with all its delirium, its riches and its vastness.

Though not altogether extinct, cattle raising has been gradually phased out in the Pantanal and replaced with new undertakings. In the last decade, traditional cattle ranches across the two states that house the Brazilian wetland, have transformed and adapted to new pursuits, such as ecotourism, which relies on the limitless appeal of a biodiversity ranked amongst the richest and most robust on the planet, and other crowd-pullers like hunting and, particularly, fishing. Some municipalities, such as Cáceres in Mato Grosso, have invested in annual sports fishing events to draw in the tourists.



Less concentrating than the once-prominent extensive cattle farming, organized tourism is something still new to the region, having only begun a little more than a decade ago. Compared with ranching, its productive chain presents ampler possibilities for incorporating a larger number of individuals. However, its assimilation does not come without its own exacting cultural, political, economic and ecological conflicts involving the most diverse, but inter-related parties, including entrepreneurs, government and the native population. In order to be fully developed, tourism needs investment in infrastructure and skills training, applications that, in the short term, bring social benefits in return. As a cultural phenomenon, it tends to advance, albeit in disguise, upon settled values and beliefs seeking to establish new parameters to substitute time-honoured models.

But it is in the issue of natural patrimony that reside the main causes for controversy, around which, not always impartially, rally so many defenders and critics of tourism in Pantanal.

The wetland ecosystem is fragile and the aggressions it so relentlessly suffers are affecting its delicate balance. These aggressions largely stem from the planaltine areas, the cradle of most of the fluvial currents that flow into and replenish the rivers that reach the wetland plain. The most incisive impacts can be felt in these rivers and are related, among other factors, to the erosion of their banks, mostly caused by agricultural encroachment, a phenomenon recently associated with the boom in agribusiness throughout the Brazilian Mid-West.

The issue is further aggravated by the absence of sanitation and effluent treatment programs in the urban regions of Cuiabá, Várzea Grande, Santo Antônio de Leverger and Barão de Melgaço, the sources of the most intense and devastating aggressions. Each day, these cities dump huge quantities of effluent and garbage into the beds of the Cuiabá and Coxipó rivers, whose waters reach the Pantanal with untold levels of contamination.

The transition from one productive model to another also, and principally, raises concerns about the sustainability and development of the traditional populations that have inhabited the Pantanal for centuries. These peoples, whose cultures are laden with historical

values, are prominent and perhaps even the most important players in the context of environmental preservation. As such, their inclusion as agents in new development processes becomes clearly strategic, as strategic as respecting their wealth of tradition, the exuberance of their beliefs and the altruism at the heart of their values. Integrating these communities on programs for alternative sources of income and sustainable labour is thus one of the essential conditions for the rational exploitation of the Pantanal's natural resources.

The option for ecotourism as a development model to be implemented in the Pantanal has, thanks to the actions of the last two state and federal governments, been gradually encouraged and assimilated. Programs to promote and facilitate the entrance and installation of new tourist enterprises have been gaining space, though still somewhat restricted, among official authorities customarily more occupied with a litany of agribusiness-related tasks geographically based beyond the wetland.

Ecotourism is closely connected with natural heritage. On the Ecotourism Society website, cited in a study conducted by the OCDE – *Organização para a Cooperação e Desenvolvimento Econômico* (Organization for Economic Cooperation and Development), Ecotourism is defined as “responsible travel to natural areas that conserves the environment and improves the wellbeing of local people.” Considered one of the most promising activities in terms of biodiversity conservation and with market potential yet to be fully evaluated, ecotourism is based upon directives that could just as well be supported by the precepts of the thought of the private sector as by the common dogmas of any state-based model. Among the common elements in these directives are the demand for effective measures for the preservation and conservation of natural patrimony; the inclusion of the community in the various dimensions of its processes; and the rational pursuit of profitability and sustainability.

It is because of these characteristics that ecotourism has been defended as a viable economic alternative for Pantanal. Its defenders claim it presents the most effective possibility for making use of the incalculable natural resources of what is one of the most fertile

biomes on earth without unsustainable aggression against the environment and with due concern for the native populations that live in the region. More reticent players advocate the definition of structural standards that classify investments in the area sector by sector according to their expected impacts, among other factors.

Two of the directives already mentioned in this article were fundamental to the decision taken by Sesc (Commercial Social Service) to implement the Sesc Pantanal Project, begun in 1996, in the municipalities of Paconé and Barão de Melgaço, both in Mato Grosso: the preservation and conservation of natural patrimony and the inclusion of the communities in the social development plans.

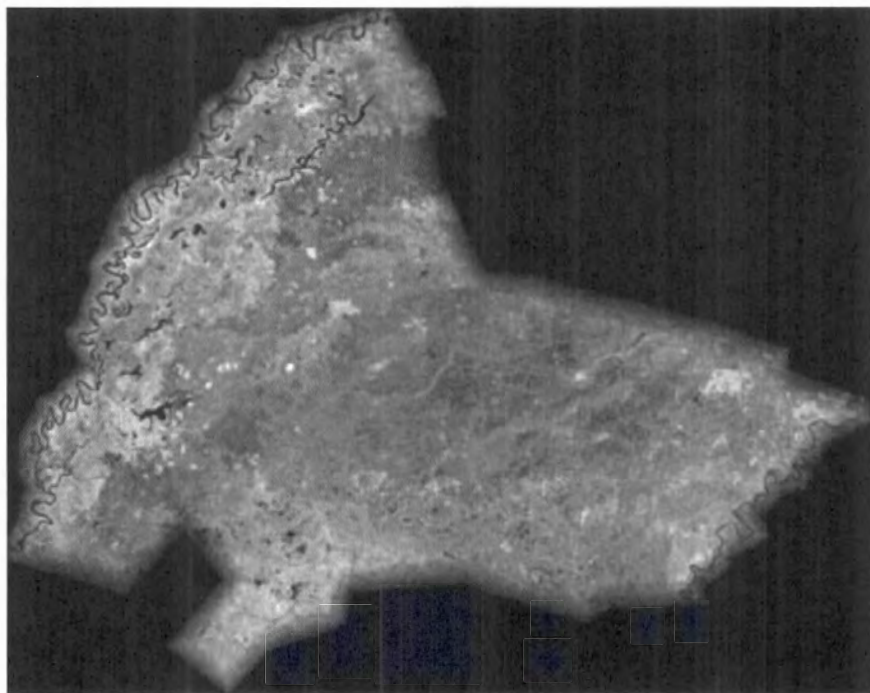
## Sesc Pantanal Project

The *Serviço Social do Comércio* – Sesc (Commercial Social Service) is an independent social organization created and run by businesspeople from the Commercial and Service sectors. It is entirely funded with resources from these business sectors and its mission is to develop programs targeting the wellbeing and development of those who work in them and their families. Sesc has been present nationwide for nearly 60 years, though with greater visibility in the state capitals and other large Brazilian cities. Its activities, in the fields of Health, Culture, Education and Leisure, have a typically urban profile, as the needs of the public it represents would dictate. By positioning itself to participate in national policies for the protection of biodiversity, Sesc has put its agenda in syntony with society's most taxing current concerns. Its choice of Pantanal also reflected growing national fears about the region's socioenvironmental problems.

The Sesc Pantanal Project is a biodiversity preservation and conservation program located in the municipalities of Poconé and Barão de Melgaço, whose territories together account for 29 thousand square kilometres of wetland. The Project's headquarters is located in the Sesc Pantanal Private Natural Heritage Reserve, a 106 thousand-hectare protected area exclusively turned over to scientific research

and the sustained use of the wetland biome. The Project also includes the Hotel Sesc Porto Cercado, dedicated to ecotourism, and an Activities Centre in the town of Paconé that runs social programs for the benefit of the local populations living around the Reserve. Two other operational units, the Sesc Baía das Pedras Park and the Administrative Base, complete the Project. The Administrative Base, situated in Várzea Grande, is the Project's administrative nucleus, while the Park is designated for the running of experimental activities.

The roles of the PNHR, the Hotel and Paconé Activities Centre acquire relevance within the Project's organizational structure. Their distinct missions – respectively environmental preservation and conservation, ecotourism and socio-assistentialist activities – are all features of the umbrella concept at the heart of the Project: sustainable social development, the conceptual template and source of all of Sesc



Satellite images of the Sesc Pantanal Private Natural Heritage Reserve, Barão de Melgaço (MT).



Pantanal's proposals in relation to Nature and to the workers and communities located in the vicinity of the Reserve.

According to their HDI – Human Development Index ratings, Poconé and Barão de Melgaço rank amongst the 10 least developed municipalities in Mato Grosso State. On a national level, both featured among the 5,507 Brazilian municipalities in the Atlas of Social Exclusion in Brazil (Cortez Editora, 2003), numbered 3,251 and 3,491 respectively.

The population of the two municipalities, according to figures from the last *Instituto Brasileiro de Geografia e Estatística* – IBGE (Brazilian Institute of Geography and Statistics) Census, is 38,455 inhabitants, 80% of whom live in Paconé. Demographic growth over the last decade has been practically zero: between 1991 and 2000 the population of Barão de Melgaço oscillated between 9,857 and 7,682 inhabitants, a reduction of 22%, while in the same decade the population of Paconé remained practically unchanged, with a slight growth of around 3%. In the same period, the State of Mato Grosso presented a population growth rate of almost 26%.

The sustainable social development principles that guide the actions of the Sesc Pantanal Project centre its approach around the following main aspects:

- Scientific knowledge of the various ecosystems that make up the Pantanal, attained through studies and research conducted in partnership with universities and relevant organizations (around 40 research projects have been executed, or are currently underway, by such institutions as the Federal University of Rio Grande do Sul (UFRGS), the University of São Paulo/ Luís de Queiroz Superior School of Agriculture (USP/Esalq), the Federal Universities of Rio de Janeiro (UFRJ), Mato Grosso (UFMT) and Paraná (UFPR) and the Brazilian Company for Research in Cattle Raising (Embrapa), among others);
- Ecotourism as an activity that strengthens the local economy, increasing employment figures and per-capita income among the population, expanding and improving regional infrastructure,

providing professional skills for a significant number of individuals, with the possibility of their becoming multipliers of the knowledge acquired, the introduction of constructive and management (eco-technical) models that soften or eliminate aggressions against the environment;

- Integrated environmental education activities, conducted through its own projects or by supporting community initiatives, designed to help identify and seek solutions to collective and domestic problems that have repercussions on the community and that affect quality of life;
- Stimulate the search for knowledge and intellectual progress by establishing schools, libraries, courses and by providing access to modern information technologies (SESC Pantanal maintains a school for 400 children in Paconé, plus a library, cinema, dental clinic and public internet facility);
- Projects targeting communitarian production with a view towards generating income and improving quality of life – such projects promote local development through the sustainable use of renewable natural resources for economic ends, aggregating value and stimulating the launch of communitarian products on the market.

The community approach has successfully provided orientation for some projects already up and running, such as *Projeto Borboletário* (The Butterfly Farmer Project), through which 25 families, united under the Poconé Butterfly Farmers' Association, have mastered the insect's life and reproductive cycles and currently re-stock the Butterfly Zoo at Hotel Sesc Porto Cercado, thus guaranteeing their livelihood and opening up new market prospects. Another successful endeavour has been *Projeto Colméia* (Beehive Project), still in its first year, which has enabled 12 families from the Bom Retiro district of Barão de Melgaço to engage in the organized and optimised production of wild honey through the newly created Arapi – the Bom Retiro Apiculture Association. Other initiatives underway target the organized involvement of the community in initiatives to avail of and commercialise

the abundant supply of Cambaru chestnuts and Macauba palm nuts found in the two municipalities and which the local populations are only now beginning to value as an economic activity.

Though certainly one of the most important factors, the economic angle is not the main determinant of development. Many and complex are the variables capable of influencing the processes of socioeconomic and cultural transformation of any given community. Without doubt, motivation, born of the embryo of knowledge, is one of the catalysing forces behind individual and collective progress. By encouraging the communities to work towards overcoming a significant number of the problems they face, the SESC Pantanal Project, without being paternalistic, reinforces this drive with affirmative actions of a socially mobilizing character that highlight the humanistic dimension of its mission and contribute to the sustainable development of the wetland communities.



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# Apremavi's contribution to the conservation of biodiversity in Brazil

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Miriam Prochnow<sup>14</sup>

The *Associação de Preservação do Meio Ambiente do Alto Vale do Itajaí* – Apremavi (Association for the Preservation of the Environment of the Upper Itajaí Valley) began 18 years ago with the objective of curbing deforestation in Santa Catarina. At the time, in the Itajaí Valley alone, there were 450 lumbering operations cutting down native trees day-in, day-out, without end. The main target was the magnificent forest in the Ibirama Indian Reserve, which was utterly laid to waste.

With this tragic beginning, Apremavi decided to follow two parallel courses of action in its conservation strategy for the Atlantic Forest, the second most endangered biome in the world. The first of these was to do what all activists do: “blow the whistle”, that is, denounce environmental crimes on the basis of proof and sound argumentation. The second was to put our “nose to the grindstone”, as it were, and show how the possible methodologies for recovering and maintaining environments and biodiversity work in practice.

In terms of the denunciation of environmental crimes and other activities with environmental impact, Apremavi has a long list of cases, the most emblematic of which have been the serious incidences of deforestation that have occurred over these last 18 years,

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14. Miriam Prochnow – Educationalist, Specialist in Applied Ecology, President of the Apremavi Advisory Council and General Coordinator of the Atlantic Forest NGO Network.

the issue of management plans for endangered species, the actions against the installation of a fish breeding program based on the use of swine excrement and our various battles against hydroelectric stations, whether large or small, which cause enormous damage to biodiversity. Good examples are the Small Electrical Centres (SECs) at Salto Pilão and Ibirama, which could, respectively, become responsible for the disappearance of the endangered and endemic species *Raulinoa echinata* and *Dickia ibiramensis*.

Speaking of *Dickias*, it is worth remembering that *Dickia brevifolia* has already been affected by the Itá Hydroelectric Plant, the theme of the first video produced by Apremavi, entitled “*Estreito do Rio Uruguai, até quando?*” (Straits of the Uruguay River – For how long?), and that the *Dickia dystachia* received its death sentence in June 2005 with the closure of the Barra Grande floodgate – a death sentence handed down by a combination of the companies responsible for the work, Ibama, the Ministry of Mines and Energy, the Federal Public Ministry and the Federal Justice System.

Barra Grande is not only an example of the struggle against species extinction in itself, but is also one of the icons of disrespect for environmental legislation, which puts entire ecosystems at risk. In this case, the threatened ecosystem is Araucaria Forest, of which only 3% remains, and which Apremavi has been working to protect since its foundation.

The Araucaria Forest is a cause that connects denunciation and the construction of models. In addition to the activities mentioned above, Apremavi has worked hard to curb the destruction of these precious forests and to preserve what remains of them. In 1987 the first steps were taken to preserve the eight thousand araucaria trees of Serra da Abelha in Vitor Meirelles with the beginning of the process that led to the creation of the *Área de Relevante Interesse Ecológico* – Arie (Area of Important Ecological Interest) in 1990.

Since then there have been many processes supporting the creation of Conservation Units, which are fundamental to the protection of biodiversity. One of the most important is the Municipal Atlantic Forest Natural Park in Atalanta, where, as part of a pioneering

initiative, one of the first experiments in the execution of Terms of Partnership between a Public Interest Civil Society Organization and a municipal government is underway with the objective of setting up and running a municipal Conservation Unit.

Other highlights have been support for the creation of the Serra do Itajaí National Park and the studies and campaigns carried out for the creation of Araucaria Forest Conservation Units in Paraná and Santa Catarina.

On another level of practical activity, Apremavi has also engaged in developing methodologies that can be applied for the purposes of environmental recuperation. One example of this is the “*Jardim das Florestas*” (Forest Garden), a nursery we managed to set up with seedlings of native trees. The nursery, which began as a collection of 18 little seedlings at the back of a garden, today has the capacity to produce six hundred thousand seedlings of 100 Atlantic Forest species per year.

These seedlings are used in recovery programs in ciliary forest and other areas of permanent preservation, as well as in legal reserves and in projects for the enrichment of secondary forests, agroforest systems, profit-oriented reforestation using native trees, and in organic farming.

Based on the experiments already carried out down through the years, which have involved hundreds of landowners and the planting of more than a million seedlings, Apremavi has managed to develop its “Property and Landscape Planning” Program, which offers interested landowners a range of actions designed to improve the environmental conditions of their properties, whether individually or as a set. Also in line with this “Good Property” concept, we have worked with the business sector to improve the programs installed at some companies.

In addition to contributing to the conservation of biodiversity, the planning of properties and landscapes also offers conditions for the development of a new concept, “agritourism”, which allies preservation with economic benefit.

All of these activities receive further support from the production of educational materials, without which our true “mission” would be impossible. We publish primers, books and videos that complement

our training and environmental awareness activities, whether for specific target publics or for the community in general.

The challenges facing the conservation of biodiversity in Brazil are still huge and a great deal of joint action will be needed in order to get this immense work done. We believe that non-governmental organizations have an enormous contribution to make and that they are willing to collaborate in any way that lies within their reach.

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# Implementation of Article 8 of the Convention on Biological Diversity – Alien invasive species that threaten biodiversity

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Sílvia R. Ziller

Alien invasive species are those that, in addition to arriving and surviving in ecosystems in which they do not naturally occur, manage to adapt, reproduce and spread in such large numbers that they drive out native species and take over the environment. They tend to cause alterations in the functioning of the ecosystems and loss of productive capacity, thus decharacterizing the landscape and substituting native species to the point of causing local-level extinctions.

Alien invasive species are recognised today as the second major cause of loss of biodiversity on the planet, losing out only to the direct conversion of environments for human use. Though the problem has been treated as a priority at meetings of the Parties to the Convention on Biological Diversity, it is still largely ignored in the majority of countries. There is a shortage of practices to control existing biological invasions and to prevent the entrance, voluntary in 75% of cases, of new invaders that will become problems in the future.

In 2002, recognising the need to take some action in the face of the lack of perception of the problem in Brazil, the Horus Institute for Development and Environmental Conservation launched a specialist website on the issue. In the space of three years the five hundred or so initial hits per month grew to more than thirty thousand. This bilingual site is still the main source of information on invaders in Brazil, offering technical fact sheets on the country's invasive species, a photo gallery, scientific articles, links to other sites, a media

history on the theme, among other resources. The media has been covering the problem with greater intensity since 2003, when the theme also started to feature at scientific events throughout the country.

In 2004, the company Aracruz Celulose S.A. sought our technical assistance to contain the threat posed by alien invasive species on its more than one hundred thousand hectares of legally protected Atlantic Forest in Espírito Santo and southern Bahia. In addition to the presence of African love grass, the result of the prior pastoral use of this land, today covered by commercial eucalyptus plantations, trees like African oilpalm, acacia, white leadtree and jupiniam were also becoming a more and more frequent feature in the forest landscape and physiognomy. Item 3.5 of Norm NBR 14789, by Cerflor, the Brazilian forest certification system by which the company is certified, requires "the monitoring of invasive species of wild animal and plant that could alter the balance among existing species in areas of ecological interest", as well as the existence of "conservation and management measures or plans" for these areas.

The Aracruz Celulose / Horus Institute partnership, sealed in 2004, focused on developing methods to control these species and on drawing up a conservationist management plan for the company's native forest reserves. The first year was taken up with control tests, training of personnel and field inspections. Other, albeit less frequent species, also joined the list, such as mango, jackfruit, guava, *jambo* and castorbean.

In 2005, 34,000 hectares were mapped in order to identify the level of invasion in each of the company's areas. The results show that there is some form of biological invasion in 95% of the areas analysed, even if only by a few plants or African love grass. Invading tree species were detected in 42.9% of the 4,926 points sampled.

Based on this mapping, a control strategy was developed for Aracruz Celulose prioritising less severely invaded preservation areas in the vicinity of more than 2,000 tracts of eucalyptus. The action taken to control these alien invasive species was programmed according to the same logic as fire fighting, starting with pockets of less intensity

and smaller size. As the invasion process is dynamic and its growth is constant, albeit relatively slow, the best cost/benefit relation lies in combing the largest possible area in which species could be eliminated most easily and in the shortest possible time. The most severely invaded areas come last. The treatment proposed involved the mechanical elimination of alien invasive species followed by the chemical treatment of the stumps. The plan also envisages revisiting the treated areas every two years to clear away any plants that have grown from the existing seed stock or shoots that may have emerged from the stumps.

Clearing away alien invasive species along the access roads is another priority, as these constitute dispersion routes for seeds stuck to tyres and other parts of vehicles. The management of the forest plantation tracts will incorporate the removal of any other invasive species that were left behind, as the cleaning process focused principally on love grass. By 2006, Aracruz Celulose plans to engage three teams in the full-time control of alien invasive species in its areas of Atlantic Forest. Mapping of the presence of invaders in natural forest fragments is also set to continue as the program proceeds, so as to include other areas beyond those already mapped.

Such a practical treatment of the problem of alien invasive species and partnership with a scientific NGO are pioneering initiatives in the forestry-based private sector and in the private sector in general in Brazil. The company's initiative also stands out when we consider that a thorough lack of recognition of the problem on the part of the certification agencies means they tend to be less than rigorous and assertive about enforcing their prerequisites for the control of invaders.





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# Companhia Vale do Rio Doce and the implementation of Article 8 of the Convention on Biological Diversity

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Companhia Vale do Rio Doce

The human being is but one out of the 1.75 million species of life known to exist on earth. The scientific community acknowledges that there are millions more species yet to be discovered, in which it will be possible to identify active principles with a multitude of applications for humanity. This realization underlines the importance of protecting, preserving and conserving biodiversity, which the Convention on Biological Diversity (CBD) defined as "...the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems".

This definition demonstrates the amplitude and subsequent importance of the theme of "biodiversity" – or "biological diversity" –, which encompasses everything from the simplest bacteria to the most developed vertebrates, the human being. Everything that lives is directly involved in this theme, which has, in recent years, and principally from the 90s on, won more and more space on the world stage. The Convention on Biological Diversity (CBD) was signed in June 1992 during the Rio-92 United Nations Conference on the Environment and Development. Work on its implementation began the following year, with the initial adherence of 30 countries, including Brazil. By 1999, 175 countries and the European Union had ratified the Convention.

The concepts and measures of the CBD are gradually being implemented in all of the signatory nations. In order to accompany and conduct this implementation, periodical conferences (Conferences of the Parties – COPs) are convened with a view to fostering the exchange of information among representatives from countries involved with the theme and to fine tune the effectiveness of the process. Companhia Vale do Rio Doce (CVRD), as a company in the mining sector, is one of Brazil's official representatives. So far, seven COPs have been held: Nassau (Bahamas); Jakarta (Indonesia); Buenos Aires (Argentina); Bratislava (Slovakia); Nairobi (Kenya); The Hague (Holland) and Kuala Lumpur (Malaysia). The 8th Conference of the Parties (COP-8) will take place in Brazil between May 8 and 19, 2006, and will feature representative delegations from 188 countries. The fact that the event will be held in Brazil, the first country to sign the CBD and "owner" of the world's largest biodiversity, testifies to its firm commitment to the theme and its position of global distinction on the subject.



*Araruma and Ara chloroptera*

The main goal of the CBD is to encourage the adherence of governments and society, especially of companies from all sectors of the economy, and this is where Companhia Vale do Rio Doce plays a relevant role. Today, we are one of the Brazilian companies that make the biggest contribution to the conservation of the nation's biodiversity, integrating operational activities and the continuous drive to conserve and rehabilitate the ecosystems in which we operate. We are present on five continents and in 14 Brazilian states. Our installations are to be found in six of the seven national biomes: Amazon Rainforest, Atlantic Forest, Cerrado savannah, the Coastal and Marine Zone, Pantanal swampland and Caatinga scrubland. As one of the world's leading companies in the mining and logistics sector, CVRD makes considerable investments in the ongoing improvement of the environ-

mental quality of its activities. This means adequately managing its operational relations in the natural environment.

CVRD runs various initiatives that demonstrate its commitment to the effective implementation of the CBD, whose last line of coordination in Brazil is the Biodiversity and Forests Secretariat of the Ministry of the Environment. This report highlights actions for the in-situ conservation of biodiversity that have been designed in accordance with the guidelines set down in Article 8 of the CBD, which deals specifically with this theme:

#### **CDB – Article 8 – In-situ Conservation**

Each Contracting Party shall, as far as possible and as appropriate:

- a) Establish a system of protected areas or areas where special measures need to be taken to conserve biological diversity;
- b) Develop, where necessary, guidelines for the selection, establishment and management of protected areas or areas where special measures need to be taken to conserve biological diversity;
- c) Regulate or manage biological resources important for the conservation of biological diversity, whether within or outside protected areas, with a view to ensuring their conservation and sustainable use;



Companhia Vale do Rio Doce – among the top global mining and logistics company.

- d) Promote the protection of ecosystems, natural habitats and the maintenance of viable populations of species in natural surroundings;
- e) Promote environmentally sound and sustainable development of lands adjacent to protected areas with a view to furthering the protection of those areas;
- f) Rehabilitate and restore degraded ecosystems and promote the recovery of threatened species, *inter alia*, through the development and implementation of plans or other management strategies;
- g) Establish or maintain means to regulate, manage or control the risks associated with the use and release of living modified organisms resulting from biotechnology which are likely to have adverse environmental impacts that could affect the conservation and sustainable use of biological diversity, taking also into account the risks to human health;
- h) Prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species;
- i) Endeavour to provide the conditions needed for compatibility between present uses and the conservation of biological diversity and the sustainable use of its components;
- j) Subject to its national legislation, respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices;
- k) Develop or maintain necessary legislation and/or other regulatory provisions for the protection of threatened species and populations;
- l) Where a significant adverse effect on biological diversity has been determined pursuant to Article 7, regulate or manage the relevant processes and categories of activities: and
- m) Cooperate in providing financial and other support for in-situ conservation outlined in subparagraphs (a) to (l) above, particularly to developing countries.

## Mining and biodiversity

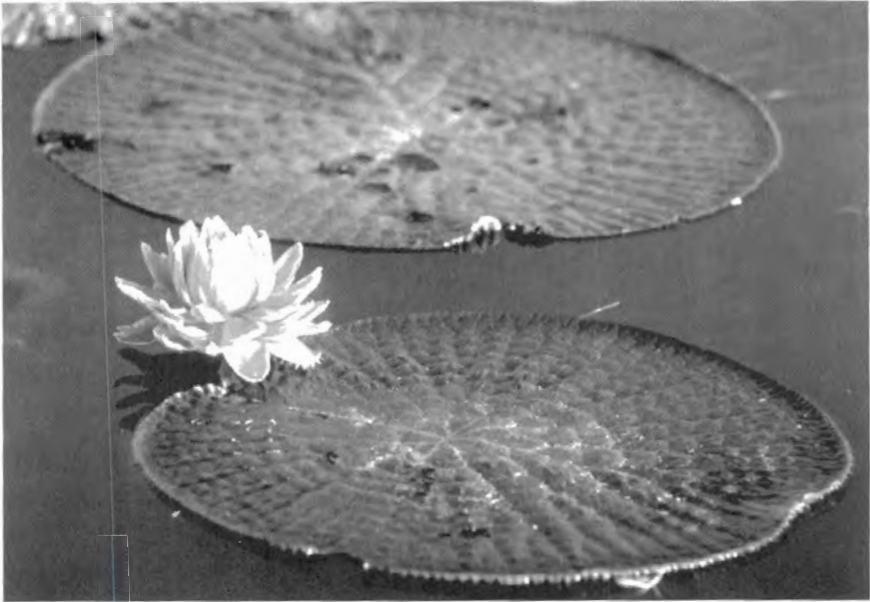
Compared with other forms of land use that can result in loss of natural habitat, such as intensive agriculture and industrial or residential development, mining typically occupies only a small portion of the land surface of a region. However, the impact the mining sector is perceived to have is out of proportion with the reality. Great care is taken with the distribution of concessions, the way the prospecting is done and how the mines are operated.



Guest house – Flona, Carajás.

Any changes in the biodiversity could affect the communities that depend on those natural resources, such as indigenous communities or other groups traditionally “connected” with the land. In Carajás, in the state of Pará, CVRD carries out a large portion of its mining operations inside a National Forest. That said, the company interferes with a mere 2% of the total forest area, while preserving the other 98%, which goes to show how mining activities are extremely localized and can be ecologically sustainable.





*Nimphaea sp. (Water Lilly).*

## CVRD and biodiversity

The mining sector has to show its shareholders, clients, employees and society in general that the investment it makes in biodiversity does not only bring benefit to the companies themselves. The sector ought to give society a clear picture of the volume of investment and the positive environmental impact that large mining companies generate for the protection and rehabilitation of biodiversity in Brazil and abroad.

Maintaining partnerships with government organs, NGOs and research institutes is one way of ensuring lower risk for CVRD's operations, as ecologically sound actions add value to the business. In accordance with its environmental policy and internal directives, CVRD avails of management systems and organizes its activities in an integrated and continuous manner, thus guaranteeing lower risk, greater care in land management and the preservation of the quality of life of its employees and neighbours.



## Companhia Vale do Rio Doce Environmental Policy

CVRD considers the environment to be a fundamental component for the quality of its products and services, and declares itself committed to sustainable development involving a balance between environmental protection and economic growth needs.

For this reason, CVRD adopted economically viable and compatible environmental protection measures, which commit the company to:

- Maintaining an Environmental Management System with the objective of guaranteeing that its activities are carried out in accordance with the relevant legislation and Company-set standards. Where no specific legislation exists, CVRD shall use the best environmental protection methods available and thus reduce risks;
- Educating and training its employees in such a way that they can act in an environmentally correct manner, by implementing and applying the environmental policies;
- Developing research and incorporating new technologies for the continuous improvement of its activities, with the objective of reducing environmental impacts and the consumption of materials and energy;
- Maintaining a permanent dialogue with employees and communities, with the aim of constantly improving its environmental initiatives;
- Endeavouring maximum efforts to ensure that companies in the CVRD system adopt practices that are compatible with its environmental policies;
- Setting requirements for its suppliers' products and services to prove environmental quality.

The CVRD Environmental Policy expresses the company's commitment to the environmental cause and constitutes the basic directive that guides the setting of its environmental quality standards, a fundamental requisite for maintaining its competitiveness and strong position on the international scene. Operating in accordance with the stipulations of the company's Environmental Quality Management System, all of the operating units hold the required licenses and environmental permits and make sure that they remain in compliance with environmental legislation at all times. This operational tool is the guarantee that all CVRD employees, service providers and suppliers

are educated and trained in best practices for air and water quality, industrial waste management, the improvement of industrial processes, valorisation of environmental education and, above all, are strengthened in their roles as citizens. In short, it guarantees that they are committed to the environment.

In addition to the effective actions of companies and environmental organs, the country's biodiversity depends on the attitude of each individual. Corporate environmental systems enable clear lines of action focused on the rehabilitation of ecosystems and on the protection of Brazilian environmental heritage. For CVRD, environmental quality is a strategic factor. Applying the principles of sustainable development is indispensable to our business, as it allows us to integrate good operations management with the preservation of biological diversity.

## Vale do Rio Doce Environmental Institute (IAVRD)

IAVRD was created in 2001 to conduct scientific research and inventories, draft management plans, rehabilitate used areas and manage the Vale do Rio Doce Nature Reserve and the Company's parks. The Institute has centres in Linhares (Espírito Santo), Carajás (Pará), Itabira (Minas Gerais) and São Luís (Maranhão).

### *Tubarão Botanical Park*

CVRD set up the Vale do Rio Doce Botanical Park in Vitória, Espírito Santo in 2004. This 33-hectare park is located inside the Company's green belt. The green belt, which covers 580 hectares, corresponds to 40% of the total area of the valley and is the largest forest tract in Vitória. Some six million seedlings of regional species have been planted in the belt, while another 10 thousand hectares are currently being restored with the planting of 15 thousand seedlings of exclusively Atlantic Forest species from the Vale do Rio Doce Nature Reserve.

The Park, which is the venue for a range of activities, is open to the public and admission is free. This environmental education centre actively contributes to sensitising people as to the importance of conserving biodiversity. The Park is also an important tool for research and forestry development, opening up experimental possibilities for the enrichment of the flora and fauna.

### *Zoobotanical Park of Carajás*

The first park created by CVRD, some twenty years ago, the Zoobotanical Park functions on an area of 30 hectares of exuberant forest, home to roughly a hundred species of orchid and 295 species of animal. The Park's objective is to present the biodiversity of Carajás to local visitors, students and researchers, as well as provide support for the study and management of wild fauna captured and reintroduced into their natural habitats. The Park currently houses a collection of seeds, fruits, an orchid centre and ant nursery/laboratory.



Lake at the Zoobotanical Park of Carajás.

## Protected areas and CVRD

In agreement with Article 8 of the CBD, CVRD runs environmental conservation activities in various protected areas, whether on the company's own property or in conjunction with environmental organs. CVRD has assisted Ibama in the implementation of Conservation Units and continues to offer support for their protection. With a view to generating sustainable social and economic benefits, the Company plays an active role in evaluating and protecting original flora and fauna; in research and development; in supporting environmental management plans and proactive community development.

The protected areas that receive CVRD support through cooperation agreements with Ibama and other environmental organs are:

Protected areas	Date created	Area(ha)	State
Apa do Igarapé Gelado	5/5/1989	21,600.00	PA
National Forest of Tapirapé-Aquari	5/5/1989	190,000.00	PA
Tapirapé Biological Reserve	5/5/1989	103,000.00	PA
National Forest of Carajás	2/2/1998	411,948.87	PA
National Forest of Itacaiunas	2/2/1998	141,400.00	PA
Xikrindo Cateté Indigenous Land	12/24/1991	439,150.50	PA
Vale do Rio Doce Nature Reserve	*	21,787.00	ES
Sooretama Nature Reserve	9/20/1982	24,000.00	ES
<b>Total area protected</b>		<b>1,352,886.37</b>	

\* Area belonging to CVRD. The first fields were purchased in the 1950s.

### *Amazon Rainforest*

The Amazon rainforest is recognised worldwide for the exuberance that comes of its unique biodiversity. CVRD exercises a fundamental function in the conservation of this most singular biome, working alongside Ibama in five adjacent Conservation Units that together comprise a mosaic of protected areas. Thanks to the efforts of CVRD and Ibama, this mosaic currently represents a "green island"

where nature has been conserved and respected – a true source of pride for the Company.

### *Carajás National Forest*

In 1980, through decree nº 54/80, Companhia Vale do Rio Doce created the Geamam – *Grupo de Estudos e Assessoramento sobre Meio Ambiente* (Environmental Study and Advisory Group), a multidisciplinary group made up of renowned scientists reporting directly to the Company Presidency. Through their recommendations, these scientists filled a gap in the environmental legislation of the day, as they orchestrated actions for the benefit of the environment that would only later become legal obligations for enterprises like CVRD. This attitude, which predated the CBD by more than a decade, demonstrates the Company's level of voluntary initiative when it comes to the issue of biodiversity.



Lush vegetation – Flona, Carajás.

Geamam's duties were to:

- Study, discuss and propose measures to lay solid foundations for the rational use and conservation of natural resources in areas under the jurisdiction of, or belonging to CVRD;
- Give opinions and make suggestions concerning preventive measures that could be implemented to avoid or reduce environmental damage;
- Study plans, programs or projects on environmental issues and the use and conservation of natural resources; and
- Make recommendations within the bounds of its specific powers on any technical issues submitted to the Group for consideration.

In 1986, the Federal Government awarded Companhia Vale do Rio Doce the concession of the right to use a total of 411,948.87 hectares of land in the Serra dos Carajás region. The studies that supported the concession were carried out by Getat – *Grupo Executivo das Terras do Araguaia-Tocantins* (Executive Group for the Lands of Araguaia-Tocantins) and CVRD and were approved by the *Conselho Interministerial do Programa Grande Carajás* (Inter-ministerial Council of the Greater Carajás Program), which, with a view to securing protection for the Carajás Mineral Province, found the infrastructure necessary for mining the deposits to be compatible with the national strategic interest. Approval by the Federal Senate was issued by means of Resolution nº 331, published in the federal official gazette on 12/11/1986.

The Carajás National Forest was created on 02/02/98 by Decree no 2486 and is one of the Conservation Units in which the stewardship of natural resources is permitted, provided it is sponsored by the programs contained in the respective Master Plan and that statutory provisions are respected. As defined by the Decree that gave rise to it, CVRD, in conjunction with Ibama, prepared a Master Plan for the Use of the Carajás National Forest, the most appropriate tool for managing the area. The Carajás National Forest thus became the first conservation unit hosting mining operations to have a complete



Management Plan, which was approved in April 2004 under the title: Management Plan for the Carajás National Forest.

### *Actions underway in Carajás*

#### *Master Plan*

The Plan is based on a diagnosis of the physical, biophysical, and anthropogenic environment. Its key aspects centre on internal surface zoning and programs for use, which include:

- Research, extraction, processing, transportation, and sale of mineral resources;
- Encouraging the stewardship of forest resources, provided it is ecologically and economically feasible;
- Ensuring the protection of water resources, natural scenic beauty spots, historical and archaeological sites, and the biodiversity;
- Developing scientific research and activities related to environmental education;
- Developing recreational, leisure and tourist activities (ecotourism).

#### *Carajás GIS*

The Geographic Information System is a tool CVRD uses to accompany all of the socioenvironmental and operational parameters of its conservation units and surrounding regions through processes that involve imaging by satellite and plane and socioeconomic zoning.

#### *Management Plan for the Carajás National Forest*

The plan outlines the forest's current and potential uses in accordance with its goal of protecting its diversity and ensuring the sustainability of its resources, and also invests in the research needed to garner a thorough knowledge of the local biodiversity.

#### *Actions underway in the Urban Centre*

- Rubbish is separated by category and sent to the dry and organic waste recycling plant so it can be reused later as biomass;

- The Company is involved in campaigns to sensitise the population as per the importance of taking due care with waste and of making proper use of water resources. From the very beginning, the families of the employees living there have been oriented not to keep pets, such as cats, dogs and birds, so as to preserve the native biodiversity.

*Program for the Collection, Treatment, Storage and Research of Native Seeds of the Carajás National Forest*

Programs for the revegetation and recovery of degraded areas and for forest development depend on seed supply, which is currently a limiting factor on the implementation of well-run programs that require the use of native forest and non-forest species. The shortage of scientific studies on the phenology, reproductive biology, maturation and dispersion of the seeds of certain species found in specific physiognomies of the Carajás National Forest has led CVRD, in conjunction with Ibama, to decide upon the implementation of a Program for the Collection, Treatment, Storage and Research of Seeds for the National Forest Region. This plan, in addition to supplying the Degraded Area Recovery Programs (Darps), is an agent for the generation and transfer of knowledge and technology in the management of regional species.

The criteria established for the program prioritise the collection of seeds in fragmented forest with varying degrees of spontaneous recovery and in different areas of the metalophilic savannah so as to minimise gene flow problems in areas in environmental recovery. Areas bordering on secondary forest, in tracts that house transmission lines and that run alongside access routes are also visited with the purpose of collecting seeds. These ecosystems, while not particularly rich in botanical biodiversity, constitute successive stages in the process of spontaneous regeneration of the regional ecosystem and thus facilitate RAD processes. The IAVRD (Vale do Rio Doce Environmental Institute) collection team has created means for monitoring seed collection and of documenting this information in a systemised manner.

Today, CVRD's seed production is continuous and boasts high and proven morphological and genetic quality in order to better meet the needs of the DARPs. The specific goals of this program are to 1) propose a low-cost, high-performance system for the collection of seeds; 2) develop annual collection/species plans for each Darp; 3) compile a seed management database; 4) train personnel from the Carajás region to plan and carry out the collection of native seeds; 5) enable the medium (06 months) and long-term (12 months) storage of the seeds of priority species; 6) develop a low-cost seed drying and storage system, and; 7) pinpoint the most adequate drying conditions for each species.

The main results:

- Selection of 35 species for potential RAD based on laboratory germination and dormancy break tests and direct planting tests in the field (data not published);
- Drafting of an annual fructification timetable for the 35 species for potential RAD and the adaptation of suitable collection methodologies;
- Annual production of 1 to 3 tons of native seeds;
- Implementation of ten revegetation experiments via direct planting in order to assess the potential for top-soil recovery and to catalyse vegetal succession in mined areas (data not published – still in monitoring phase).

CVRD also conducts studies on vegetal species of special economic interest, such as mahogany, with a view to developing a data bank of genetic information on these species.

Difficulties encountered:

- A large workforce is required to meet the current demand for native seeds;
- Lack of structure available for treating and storing the entire production (under construction);
- Seasonality of production;

- Difficulty in collecting and treating seeds during the rainy season;

*Program for the Collection, Storage and Re-introduction of Epiphytic Species in the National Forests of Carajás and Tapirapé-Aquiri*

Activities: inventories of epiphytes (quantitative and qualitative), evaluation of the area's potential and the presence of endangered species, defining the number to be rescued; definition of the areas for the translocation of the material to be collected; definition of collection techniques (before and after the vegetation is suppressed); definition of planting procedures and, finally, monitoring of re-introduced plants.

Main results:

- Rescue and planting of more than 100 thousand plants since work began;
- Creation of three orchid houses open for visitation (ex-situ conservation);
- Development and fine tuning of collection and planting techniques;
- Botanical list of the epiphytic species of the Carajás region (not published);
- Enrichment of areas in recovery through the inclusion of epiphytic species from metalophilic savannah;

Difficulties encountered:

- Many translocated species had difficulties with environmental adaptation;
- Difficulty in planting tree-top epiphytes;
- Lack of bibliography on the subject.

## Archaeology and Speleology

Speleological surveys conducted in the Carajás Valley aim to identify, map and analyse the main physical (geospeleology) and biological (biospeleology) components of the area's caves. On the physical level, the studies will focus on tracing the origins and evolutionary histories of the caves and the sedimentary deposits (chemical and clastic). Biological analyses will undoubtedly raise important data on the faunal composition and dynamics of the caves.

With the expected completion of the speleological survey in Carajás in 2006, CVRD and the environmental organs will have a valuable tool with which to establish a conservation and protection policy for speleologically important areas, thus reconciling the company's mining activities with the conservation of the caves.

In addition to the speleological work, archaeological sites also receive special care. Groups of pre-historic hunter-gatherers are known to have occupied the region's caves some 8,000 years ago, leaving traces of human behavioural history behind them, unique vestiges capable of furnishing a deeper understanding of the relationships within and between the human groups that occupied the Amazon in pre-colonial times.



*Cyanoerpes caeruleus* (Purple horeycreeper).

### *Tapirapé-Aquiri National Forest*

Created by Decree nº 97.720/89, the Tapirapé-Aquiri National Forest is a Conservation Unit for sustainable use covering some 1,900 km<sup>2</sup> and encompassing the municipalities of Marabá and São Félix do Xingu, in Pará State.

In partnership with CVRD, Ibama is drafting the Stewardship Plan for this CU, which will guide all future actions undertaken at the Unit for the sustainable use of natural resources. To this end, as with the Carajás National Forest, a Program for the Collection, Storage and Re-introduction of Epiphytic Species is already underway.

### *Igarapé Gelado Environmental Protection Area*

The Igarapé Gelado Environmental Protection Area, created by Decree nº 97.718/89, is located in the municipality of Parauapebas, in Pará, and covers approximately 21,600 hectares. This Unit is an important buffer zone for the Carajás National Forest.

### *Tapirapé Biological Reserve*

This Federal Conservation Unit, created in 1989 and covering 103 km<sup>2</sup>, is a restricted area open to visitation exclusively for the purposes of scientific study. CVRD has been preserving and maintaining this Unit since April 1991 in accordance with the Stewardship Plan for the Reserve, which was drafted with the participation and approval of Ibama, in full compliance with all pertinent legal, technical and scientific precepts.

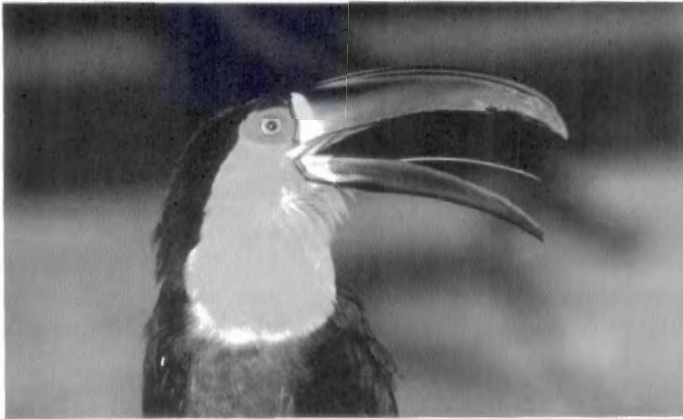
## **Atlantic Forest**

### *Sooretama Biological Reserve*

This is a Conservation Unit linked to Ibama which, along with the Linhares Forestry Reserve, corresponds to about 75% of the



Atlantic Forest in the state of Espírito Santo. At the beginning of 1999 an agreement was signed between CVRD and Ibama in which the Company assumed responsibility for the maintenance and protection of this Reserve, including emergency procedures to combat fire, which ensures the continuity of preservation initiatives for this important forest area.



*Ramphastos vitellinus* (Channel-billed Toucan).

### *Vale do Rio Doce Nature Reserve*

Committed to preserving the environment, Companhia Vale do Rio Doce prides itself on its largely untouched Nature Reserve at Linhares in Espírito Santo. Stretching over some 22 thousand hectares, the Reserve conserves one of the last and largest remaining swathes of Atlantic Forest. Despite housing the world's greatest concentration of biodiversity, the exuberant Atlantic Forest is also the second most endangered forest on the planet.

The Linhares Nature Reserve is one of the largest Atlantic Forest preservation and research and study centres in the country and attracts researchers from all over Brazil and from various nations worldwide. The Reserve's main goal is to preserve and multiply native fauna and flora, protect the environment and carry out research on its natural resources. Linhares is a centre of national reference in the production



Vale do Rio Doce Nature Reserve, ES.

of seedlings of Atlantic Forest species and has an annual productive capacity of somewhere in the region of 45 million seedlings of some 800 species from various different biomes. The seedlings are used on CVRD's regeneration projects in degraded areas as well as by the general public on other initiatives.

Given the technical and scientific knowledge amassed, the Reserve has become a centre of diffusion for programs in the preservation and conservation of natural resources, the recovery of degraded areas and the development of areas for sustainable use on agricultural land. Its activities include the following:

- Cooperation with the main Brazilian universities and recognised governmental institutions on the development of research programs, as well as research partnerships with Embrapa, Incaper and Ibama, among others;
- Research programs on large felines with a view to defining the size of puma populations and minimising possible impacts;
- Cooperation with Ibama in protecting the Sooretama Biological Reserve;
- Carrying out various lines of research into ex-situ vegetal conservation;

- Hundreds of research projects, ranging from the description of the Reserve's ecosystems to how they function;
- Guided Visitation Program for the region's schools for the purposes of environmental education, including the systematic training of public school teachers.

In December 1999, in virtue of its significant contribution to preserving the biodiversity of the Atlantic Forest, the Vale do Rio Doce Nature Reserve received Unesco (United Nations Education, Science and Culture Organization) recognition as the Costa do Descobrimento World Natural Heritage Site.

In 2004, some 5 thousand visitors came to the Reserve for its educational projects or to use its leisure and ecotourism resort.



Seeding production, Nature Reserve at Linhares.

## Protection in Minas Gerais

In Minas Gerais, CVRD permitted the IEF – *Instituto Estadual de Florestas* (State Forests Institute) to complete the agrarian regulation of the 4,400 hectares of the State Forest of Uaimi, a decision that contributed directly and indirectly to the protection and preservation of 14,200 hectares of green areas throughout the state.

## Integrated projects

### *Program for Fire Prevention and Control*

Fire is one of the main agents of degradation affecting environmental conservation units, which is why CVRD, in conjunction with Ibama, runs an extensive set of actions to prevent and combat forest fires in the Carajás region.

Among the preventive measures in place, special mention must be made of the educational campaigns and courses administered to employees, service providers and, most importantly, to the neighbouring



Fire fighting community training.

communities with a view to sensitising the individual as to the damage caused by fires and the best ways to contribute to the prevention and control of localised blazes. Fire Brigades are formed at the rural settlements and the Company provides the training and equipment they need to fight fire.

The Company has its own fire fighting system at its disposal, comprising a specially trained Fire Brigade equipped with protective clothing and devices, tools, fire engine tankers and a helicopter. The occurrence of flash fires is detected by a Control Centre, which then deploys the Fire Brigade teams stationed in all of the operational areas.

This work has helped preserve the natural heritage of the Carajás Mosaic of Conservation Units.

### *Rehabilitation of Degraded Areas*

Through research and cooperation agreements, CVRD invests in the search for technology that can enable the reproduction of more than 800 native tropical vegetal species. Six and a half million seedlings are produced and used each year in the rehabilitation of mined areas, the revegetation of hillsides and in permanent preservation.



Ongoing rehabilitation of degraded areas.



CVRD plays an active part in rehabilitating degraded areas in Minas Gerais. Some examples of this are:

- The Itabira green belt, rehabilitating an area of 38 hectares interfacing with mines, railroads and urban areas. 70% of this work was done using savannah and seasonal forest species. Prior to the rehabilitation program, this area consisted of 18 hectares of wasteland and 20 hectares of poor brushwood and land reforested with eucalyptus;
- Recovery of 400 hectares of mined area at four locations: Piçarrão, Riacho dos Machados, Maria Preta, and Caeté;
- Recovery of 74 hectares of ciliary forest and forest along the Vitória/Minas Railroad in the region of Rio Piracicaba - Maquiné. These permanent preservation areas are very important in the process of recuperating the state's biodiversity;
- Ibituruna Peak: total recovery of 150 hectares with native species near Governador Valadares, a region of strong historical significance for the local and regional population;
- Stretches of railroad in Minas Gerais, with the recovery of 50 km of slopes along the Vitória/Minas Railroad.

### *Mine Closure Guide*

Provides guidelines and procedures on best practices for the deactivation and rehabilitation of mined areas and their surroundings, including estimates of the costs involved, in accordance with norms established by the SEC (Security Exchange Commission), the regulatory body for the capital markets of the United States Stock Exchange, on which CVRD shares are traded.

The Mine Closure Guide was based upon the processes used in closing down mines at Piçarrão, Caeté, Riacho dos Machados (Minas Gerais), Almas (Tocantins) and Maria Preta (Bahia). Taken together, these areas total 400 hectares of recovered vegetation at mines located in different biomes. The guide was created to assess the environmental liabilities at both operational and deactivated mines and is nowadays





Rehabilitation of degraded areas – Itabira, MG.

considered a benchmark in Brazil by Ibram – *Instituto Brasileiro de Mineração* (Brazilian Mining Institute).

CVRD approved the creation of a fund for mine closure and the rehabilitation of areas affected by mining operations. The rehabilitation techniques are modern and include the geo-technical stabilization of the area; regularising drainage; vegetal resurfacing using cushions prepared with seeds and nutrients; and direct planting with native seedlings, leguminous plants – for nitrogen fixation –, and regional species.

### *Water Resource Management*

In 2003, the UN declared the beginning of its water decade. CVRD recognises water as indispensable to the wellbeing of humanity and to the environment as a whole, which makes it one of the Company's main concerns in all of its undertakings. The implementation of actions advocated by the CVRD Water Resources Management System (WRMS), which translates the company's engagement into a National Management Policy for this most important natural resource,

made it possible to establish Action Plans for the rational use of water that included the installation of new water recycling systems and the re-evaluation and fine tuning of the systems for the treatment of wastewater and effluent. Today, 85% of the water used in all of CVRD's units is recycled.

The quality of the water supplied to employees, sub-contracted individuals and other users, as well as the quality of the water pumped back into the natural water system are the chief concerns of the WRMS, whose phases of implementation were included in the CVRD Variable Remuneration and Profit-Related Pay Program.

### *Environmental Licensing*

All of CVRD's operational units hold environmental licenses that meet the prerequisites of the competent environmental organs. The procedures for renewing licenses or for obtaining licenses for new operations are outlined in the Environmental Information System Licensing Manual. The operations are carried out on the Company's own properties, land concessions and areas belonging to third parties. The total area of lands interfered with or directly influenced by CVRD is 2 million hectares, distributed throughout various states and municipalities, under diverse legal and normative conditions and in different natural and socioeconomic environments.

To allow for adequate management of the relationships between its activities and the territories in which they take place, CVRD is implementing a Territorial Management System. All of the company's geographic information will be integrated in a single geo-referencing database made available to all of its units by the Geographic Information System. This system will take into account the different perspectives and demands of internal users and their relations with external requirements, especially legal and normative requirements, thus enabling an objective evaluation of the interferences in each of the land areas of interest to CVRD.

## *Indigenous Communities*

Good relations with indigenous populations is an indispensable factor in the success of CVRD's activities in the sphere of influence of the Carajás Iron Project. The Company has been supporting the indigenous communities in the states of Maranhão and Pará for more than 20 years through actions in the areas of health, infrastructure, education, land demarcation, environmental protection and inspection, thus contributing to greater quality of life for some 17 thousand indians.

All of these activities are run voluntarily and in full accordance with Brazilian law and the technical orientations of the National Indian Fund – Funai, the governmental agency responsible for indigenous communities. At the moment, CVRD directly supports this entity's initiatives with the Xicrin, Gavião and Sororó communities in Pará and the Awá, Guajajara and Urubu Kaapor in Maranhão, benefiting approximately 3,300 indians.

## **Partnerships**

CVRD maintains partnerships for the conservation of biodiversity with entities, universities, research institutes and environmental organs. In conjunction with Ibama and state and municipal administrations, the company also draws up Master Plans for the Use of Protected Areas. These partnerships bring real conservation results.

## **Community action and environmental education**

The social and environmental value of all of CVRD's undertakings is carefully measured. The results are assessed in the formulation of projects for education, the development of local territory, job creation and the conservation of biodiversity. This evaluation rests on the perceptible level of improvement in the living conditions of the 3 million people CVRD attends directly in more than 500 municipalities.

In all of its activities, CVRD makes it clear that care should be taken with biodiversity in all environments - natural, rural and urban - and that only by working in tandem with the community, institutions and the government can the Company do its part toward a better future for all. This way of acting is in harmony with the proposal at the heart of the Convention on Biodiversity, while simultaneously contributing to the Company's higher market value. This goes to show society the volume of investment and positive environmental impact large mining companies like CVRD generate for the protection and recuperation of biodiversity and for the development of sustainable societies both in Brazil and abroad.

From 2002 to 2004 CVRD channelled R\$ 524 million into the environment, demonstrating its commitment to biodiversity. During the same period, it also invested R\$ 92 million in the social area, an indirect contribution to the protection of biological diversity, thus guaranteeing the sustainability of its business and strong acceptance on the market.

This investment has converted into countless initiatives, such as projects for landscapes with native species, the recuperation of hill-sides, support for the creation of plant nurseries, integrated urban cleaning projects, the protection of river heads and channels and the creation of jobs connected with environmental business in the cities in the vicinity of CVRD operations, like Parauapebas (Pará), Vitória and Linhares (Espírito Santo), Corumbá (Mato Grosso do Sul) and Itabira (Mato Grosso).

The Cidade Vale Mais (The City is Worth More) Program is an example. Focused on planning urban development strategies, this program has been responsible for initiatives in various cities. In São Luis, the population of the Anjo da Guarda neighbourhood, right beside the port, chose urban trash management as the activity in which to invest in order to generate jobs and wealth through the re-use of refuse and composting of organic trash. In 2005 the program was extended to nine other municipalities besides São Luis, Corumbá, Cariacica and the mountain region of the State of Espírito Santo, where it was already implemented.

With the definition of the Company's environmental education directives, the operational units are now developing their own projects as part of a line of action that respects the socioeconomic, cultural and environmental differences of each city. Canaã dos Carajás, a municipality in Pará with a population of 17 thousand inhabitants, where CVRD inaugurated its Sossego Mine and produces copper concentrate, is an example in terms of environmental education projects conducted in partnership with town councils and run in local schools.

The premise of these projects is the student's experience with his or her own city, the possibility of bringing about tangible socioeconomic improvements and the integration of children with their parents and teachers. In Canaã dos Carajás, the project resulted in a public library with more than a thousand titles, inaugurated in May 2005, a video library and a mini research centre on news about socio-environmental and cultural themes.

Now in its third year, the project "Heritage Education in the Area of the Serra do Sossego Project", run in partnership with the Emilio Goeldi Museum of Pará, endeavours to instil a curiosity and respect for the region's archaeological heritage in the residents of Canaã dos Carajás, as well as promoting a bid to save the region's archaeological sites. In 2004, the *Casa da Cultura* (Culture House) presented an exhibition on the cultural memory of the region, including photographs, drawings and paintings of the archaeological heritage.

In addition to this program, CVRD also launched Environmental Attitude in Tubarão, through which 1,500 employees and outsourced professionals will be trained in the concepts and practices of the Environmental Management and Quality System and Corporate Social Responsibility. For the session 2006-2008, CVRD is starting up a program to improve the educational backgrounds of youngsters and teachers in the greater Vitória area, where the Tubarão Botanical Park will be the centre for discussions to establish and improve effective environmental attitudes.

The CVRD Environment Program aims to furnish primary school educators with theory and practice on the correct use of natural resources and the protection of the environment so that they may



be aware of, responsible for and multipliers of the importance of exercising citizenship. Training these teachers in environmental education is fundamental if multidisciplinary pedagogical processes are to be implemented in schools with a view to broadening perception, forming opinions and encouraging the adoption of environmentally-oriented behaviours on the part of primary school educators.

Four environmental education centres have been inaugurated in Minas Gerais in order to continue with the Environmental Education Program in that state, where 40 thousand people, including teachers, students, their families and community leaders, have already been trained.

## CVRD publications on biodiversity and social responsibility

- *Revista BIOdiversidade*. Publication: Companhia Vale do Rio Doce. Ed. Horizonte Geográfico & Companhia Vale do Rio Doce, 05/2005. [www.vale.com.br](http://www.vale.com.br)

- *Biodiversidade em Minas Gerais – um atlas para sua conservação* (Biodiversity in Minas Gerais – an atlas for its conservation).

Developed by *Fundação Biodiversitas*, in conjunction with the Secretariat for the Environment and Sustainable Development of the State of Minas. This work presents detailed information on Conservation Units in Minas Gerais and the environmental plans of governmental and research institutions for the protection and rehabilitation of degraded areas. The Atlas serves as a guide for public and private investments in line with CBD action.





## Publications sponsored

- *Atlas Socioambiental de Paragominas e Municípios Vizinhos* – PA (Socioenvironmental Atlas of Paragominas and Neighbouring Municipalities in the State of Pará)

Developed in partnership with the Federal University of Pará. Scheduled for completion in 2006.

## Internal publications

CVRD makes a point of stressing the importance of biodiversity in the daily running of the company and of promoting this amongst its employees. The fourth issue of *Revista Atitude* and the May 2005 issue of the CVRD newsletter are examples. Both publications circulate amongst the entire staff.

- *Revista Atitude.*

*Revista Atitude* is a quarterly magazine that deals with such themes as Education, Territorial and Social Development and the Environment.





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# Far beyond the protected areas: WWF-Brazil and the conservation of biodiversity

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Nurit Bensusan

Very often endeavours born of struggle end up becoming almost universally accepted practices. A good example of this is the contrast between the resistance Oswaldo Cruz faced on his vaccination campaigns in the early 20th Century and the total acceptance the practice enjoys today. The idea of reserving land especially for nature conservation also had rather tentative beginnings, only to become the most prevalent and widely accepted instrument for the conservation of biodiversity.

Despite this ample acceptance, protected areas have continued to transform over time. Having started out in the Middle Ages as areas set aside to guarantee the supply of natural resources, they later extended to sacred places and particularly beautiful and scenic landscapes; for a spell they were considered tools for the conservation of certain species of animal or plant, or even types of landscape, while, more recently, they have come to be seen as part of a broader strategy for the conservation of the processes that generate and maintain biodiversity, that is, of ecological and evolutionary processes.

The social institutions that deal with this issue have taken – and continue to take – similar paths. Many began 30 or 40 years ago with emphasis on particular species or landscapes, fuelled by the belief that by guaranteeing protected space for these elements they could ensure their future. With time and experience they saw that in order to truly secure the conservation of biodiversity in protected

• areas they would also have to work beyond their frontiers and, moreover, would have to approach such thorny issues as the use of land and natural resources in the regions in which the protected areas were located. More recently, many institutions have started to make incursions into the field of public policy, having understood that only a more profound questioning of the prevailing development model can yield significant results in terms of preserving the integrity of biodiversity.

## The course of the WWF

Like many others, WWF started out concentrating on the conservation of species. The very symbol of the institution – the panda – is itself an endangered species. WWF's efforts to foster wildlife reserves envisaged, above all, guaranteeing the survival of certain species. Behind this concept lies an abiding ecological fundament: the effort to ensure the survival of a species necessarily obliges the guaranteed integrity of the environment in which that species lives and of the organisms with which it interacts. The beginnings of WWF-Brazil are intimately intertwined with the Poço das Antas Biological Reserve in the state of Rio de Janeiro and with the conservation of the golden lion tamarin. The campaigns to recover this little primate won the sympathy of the public, enabled the recovery of the species and, today, help in the recuperation of the Atlantic Forest in the vicinity of the Reserve<sup>15</sup>. Table 1 presents an overview of the advantages and disadvantages of planning around species in accordance with the approach adopted.

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15. For more on this work, see, in this book, the case study by Denise Rambaldi entitled "The contribution of the Associação Mico-Leão-Dourado (Golden Lion Tamarin Association) in the implementation of Article 8 of the Convention on Biological Diversity: in-situ conservation of the golden lion tamarin (*Leontopithecus rosalia*)".

**Table 1 – Advantages and disadvantages of using species for conservation planning\***

Species Classification	Advantages	Disadvantages
Endangered: thus classified by some legal or official mechanism	Legal status makes a series of actions possible	The lists are not exhaustive and many endangered species are left off
Endemic: a species that only occurs in a certain place	Limited area for the conservation of the species	There are various ways of considering areas of endemism and these species are not always at risk
Flagship: a species that calls attention, like the panda, elephant or golden lion tamarin	The support of public opinion is easily garnered	The concept has no scientific basis and these species are not always the ones most in need of protection
Umbrella: a species whose conservation guarantees the maintenance of others	Efficient and practical: a species that is capable of conserving various others	Validity not yet empirically proven
Keystone: a species whose impact on its environment is disproportionately large in relation to its abundance	Requires contemplation of both function and structure (ecological processes)	Difficult to identify. To date, few species have been identified as keystone.

\* Adapted from Groves, G.R. 2003. Drafting a conservation blueprint. The Nature Conservancy & Island Conservation. Washington.

With time and practice WWF, like various other institutions, realized that in order to guarantee the integrity of protected areas it was fundamental to understand the dynamic of the environment surrounding them, including the use of land and natural resources. Our work thus assumed new dimensions; rather than concentrating

on the protected areas alone, it now involved searching for less predatory alternatives for development and ways to avoid rupturing the ecological processes key to maintaining the ecosystems and, by extension, the biodiversity of the protected areas.

To do this, WWF began to dedicate much of its energy to projects with local communities, especially those in the vicinity of protected areas. In the beginning this was done through so-called Integrated Conservation and Development Projects (ICDPs), which aimed to ensure the conservation of biodiversity by integrating protected area management with the social and economic needs of the local communities<sup>16</sup>. Despite the relevant progress – represented by the recognition on the part of the protected areas of the important bearing the local communities' use of land and natural resources has on their conservation –, the majority of these projects were not particularly successful. One could identify many reasons for this, one of which is the difficulty conservation organizations can face in working alongside local communities, whose worldviews and priorities are often not commensurate with the conservation of biodiversity<sup>17</sup>.

Today, WWF-Brazil runs relevant projects that focus on the use of land and natural resources rather than on protected areas alone. There is also a growing awareness of the need to participate in political decision-making processes with a view to magnifying the lessons learned on community-based projects and the effective possibilities for transforming the nation's prevailing model for the use of natural resources.

16. The study by Michael Wells and Katrina Brandon, entitled *People and Parks – Linking Protected Area Management with Local Communities*, published in 1992 by the World Bank, WWF and Usaid, offers an interesting overview on ICDPs. The work is a reflection on 14 ICDP case studies throughout the world accompanied by a set of recommendations.

17. For a particularly critical article on the interaction between the large NGOs and local communities and indigenous peoples see the piece by Mac Chapin published in *World Watch* in November 2004, entitled: 'Losing touch: conservationist NGOs and indigenous and traditional peoples'. The article analyses the performance of large NGOs in their efforts to integrate local communities and indigenous peoples with their conservation agendas, often without considering that these communities have other priorities and that conservation specialists are not always equipped to deal with projects that involve human communities.



On the other hand, the planning of biodiversity conservation in protected areas has also advanced. Protected areas have come to be seen as parts of what ought to be a complementary system for the protection of biodiversity, that is, the reserves ought to complement each other, while the system of reserves as a whole needs to be complemented by other land management instruments that ensure the integrity of the ecological and evolutionary processes that maintain the biodiversity. The idea is, therefore, that protected areas would stand a much better chance of fulfilling a fundamental role in the conservation of biodiversity if they were part of a representative system; i.e., if they comprised a system that contained the highest possible number of examples of characteristic elements of biodiversity. The opportunism that led to the creation of countless areas in Brazil and in other countries is now being questioned: after all, if resources for conservation are sparse, why should we use them in areas that “appear” to be opportunities rather than saving them for use in areas of genuine importance?<sup>18</sup>

In order to identify these “areas of genuine importance” a range of methods were developed for the selection and design of priority areas for the allocation of reserves. One of these methods, currently used by WWF-Brazil, is Systematic Conservation Planning. This methodology, which is used to select new areas for the conservation of biodiversity by considering the regional scale and representativeness, is based on three core principles: complementarity, flexibility and irreplaceability.

1. Complementarity refers to the strategy whereby, prior to defining the location of a protected area, the content of the suite of reserves in the region is surveyed in order to ensure that the area selected possesses characteristics that complement those already found at the other units. This principle is important as

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18. Pressey, R.L., C.J. Humphries, C.R. Margules, R.I. Vane-Wright & P.H. Williams. 1993. Beyond opportunism: Key principles for systematic reserve selection. *Trends in Ecology and Evolution* 8 (4): 124 - 128.

- in most regions the land parcels set aside for conservation are limited, even if these limits remain somewhat unclear.
2. Flexibility is about studying the various combinations of locations so as to establish a representative system of protected areas. The existence of these combinations means there is room for negotiation and the chance of avoiding conflict.
  3. Finally, irreplaceability means that a truly important location for the conservation of biodiversity will arise in each of the possible combinations for a representative set of reserves. Irreplaceability measures the potential contribution a location could make to the conservation target and the degree to which the loss of that location would diminish the chances of attaining a representative suite of reserves.

In a rough outline, Systematic Conservation Planning can be broken down into six broad steps: 1) measuring and mapping of the biodiversity; 2) identification of the conservation targets for the region; 3) a review of the existing reserves; 4) the selection of additional protected areas; 5) implementation of conservation activities; and 6) management and monitoring of the reserves.

The first stage – the measuring and mapping of the biodiversity – runs up against our limited knowledge of the complexity of biodiversity. Biological systems are organized hierarchically, from the molecular level up to ecosystems, and their organizational strata – individuals, populations, species, communities, ecosystems – are heterogeneous. Faced with the impossibility of dealing with such complexity, but considering that the chief goal of conservation is to maintain it, all we can do is use the knowledge available to us to make partial inventories of the biodiversity in order to estimate the level of similarity or difference between the areas analysed in any given region. One frequently used method is to designate a group of species, such as vascular plants, vertebrates or butterflies, to serve as indicators for the existence of significant biodiversity in the area under analysis. Despite the popularity of this method, its effectiveness is open to question: some results suggest it works well, while others have been

less than encouraging. The use of other hierarchical levels of organization, such as sets of species, types of habitat and ecosystems, is less biologically precise, but offers other advantages insofar as these can encapsulate more thoroughly the ecological processes that sustain the functions of the ecosystems and also because there is more information available about them. The conclusion to be drawn is that the choice of information and method used to estimate the biodiversity contained in an area depends on many factors, including the availability of data, which will be different in each case. Other information, such as land ownership and possession, the presence of highways, rivers and threats to the integrity of the region, should also be collected and considered.

The second step, the identification of the conservation targets for the region, consists in translating the representativeness and persistence of the reserves into more specific and, if possible, more quantitative targets. These targets make it possible to evaluate the existing protected areas and to measure the conservation value of other areas during the selection process for the reserves.

The third step is intimately linked with the fourth insofar as the existing reserves must first be evaluated before the additional reserves can be selected. Assessing to what degree the conservation targets have already been reached by the existing suite of reserves helps to define how much is left to achieve. The methodology used for this purpose is called representative gap analysis. An extremely efficient decision-making tool is currently available for the next stage, the selection of additional reserves, in the form of algorithms that can be used to evaluate such distinct situations as, for example, whether or not to include certain areas, the acquisition costs and costs related to other use opportunities. This tool provides a basis to negotiate from, as it enables concrete evaluations of various options for the allocation and design of future conservation units.

The fifth stage, the implementation of conservation activities, requires a completely different set of measures, including the articulation of various individuals, agencies, institutions and commercial interests. Furthermore, although not mentioned by the authors, it is

worth adding that this is the stage at which the manager, armed with the various options for allocation and design supplied by the above-mentioned technical tools, begins the work of negotiating, mapping and settling the conflicts that will certainly arise at this phase in the implementation of a protected area.

Last comes the management and monitoring of the reserves. Although this is not part of the process of selecting and designing the areas, it is nonetheless a fundamental stage, as it is here that the problems start to arise, very often stemming from the process of selection and design itself. Some considerations at earlier stages of the process, such as respecting catchment basins when prescribing the limits of the unit, maintaining migratory routes and negotiating with neighbouring communities, can help prevent management problems later on.

Recently, the method has incorporated concerns for the future management and implementation of protected areas and forms of integration with the communities that make use of the natural resources of a region, thus mitigating possible conflicts.

WWF-Brazil has carried out studies using these methods specially adapted to the realities of the Amazon, Cerrado and Atlantic Forest. The aim of these studies is to help public authorities define new conservation areas. In addition to these studies, the institution also works on various other fronts in its bid to ensure the conservation of biodiversity.

## What is WWF-Brazil doing to conserve biodiversity and promote its sustainable use?

WWF-Brazil runs field projects in three of Brazil's largest biomes: the Atlantic Forest, Amazon Rainforest and Pantanal swampland.

### *Atlantic Forest*

Initially WWF-Brazil's work in this biome focused exclusively on the conservation of the golden lion tamarin and the forests that serve

as its home. Today, the Atlantic Forest Program has a wider scope both in terms of its goals and its *modus operandi*. The aim of the Program is to ally human wellbeing and the conservation of biodiversity, the maintenance of soil quality and water supply and the provision of such products as fibres, minerals, fruits and other foodstuffs. The Program favours partnerships with agrarian reform settlers, governmental and non-governmental organizations, international organs and universities.

The work is conducted on two fronts: 1) the protection of the sparse remnants of this biome through protected areas; and 2) the recovery of the Atlantic Forest landscape. This recovery consists in initiatives developed from plans designed to promote harmony between the conservation of natural resources and the existing cultures, the rational and sustainable use of those resources and the expansion of the forest cover. Among the initiatives the Program promotes for the expansion of the Atlantic Forest are the plantation of forest corridors, the recovery of ciliary forest and agriforest production.

### *Amazon Rainforest*

WWF-Brazil currently executes a protected areas program in the Amazon as a support for the government-run Arpa – *Áreas Protegidas da Amazônia* (Amazon Region Protected Areas) Program (see the article on this theme in this book). Complementarily, WWF-Brazil also has an Amazon-based program, run out of its office in Rio Branco, Acre, designed to valorise vocations in the region's forest and aquatic environments, conserving and using natural resources in a rational and lasting manner for the benefit of all social segments of the Amazon region.

This is a three-pronged initiative: 1) conservation of biodiversity and parks; 2) sustainable use of natural resources; and 3) environmental education and communication; and is run in two priority Amazonian ecosystems: 1) the Southeastern Amazon (including the states of Acre, Rondônia and part of Amazonas) and 2) the Amazonian flooded forests (floodplain forests along the Amazon and Solimões rivers that are waterlogged during the rainy season).



In addition to the work supporting the implementation of protected areas and the definition of priority areas for conservation, the Program also includes projects involving rubber sole-leather, vegetal leather, açai palmheart, aromatic products made with natural essences derived from chestnut and copaiba, and community-based ecotourism. The Program also supports community forest certification in extractivist reserves and agro-extractivist settlements; runs projects demonstrating sustainable models of industrial-scale wood extraction and mahogany management; as well as the handling of community fisheries and water resource management.

### *Pantanal swampland*

WWF has long supported conservation projects in the Pantanal swampland, but since 1999, WWF-Brazil has been running an articulated conservation program for the biome that works on various fronts: 1) supporting the creation and implementation of protected areas; 2) identifying and encouraging viable economic and environmental activities; 3) training and educating entrepreneurs to set up sustainable tourism operations in the region; 4) deepening the scientific knowledge on the area; 5) encouraging the participation of society in environmental debates; and 6) supporting the definition of public conservation policies.

The Program is made up of projects that involve scientific activities, training, environmental education, communication and public policy and enjoys partnerships with the state governments of Mato Grosso do Sul and Mato Grosso, municipal governments, universities, NGOs and landowners participating in the construction of a sustainable development model for the Pantanal.

### From protected areas to public policies

Among WWF-Brazil's field projects are numerous initiatives conducted in conjunction with protected areas, such as the Poço das



Antas Biological Reserve (Rio de Janeiro), the Fernando de Noronha National Park (Pernambuco), the Cajari Extractivist Reserve (Amapá), the Chico Mendes Extractivist Reserve (Acre), the Chapada dos Veadeiros National Park (Goiás), the Jaú National Park (Amazonas) and the Tumucumaque Mountains National Park (Amapá). Without doubt, WWF-Brazil's contribution to each of these protected areas, among the others with which it has worked, has been, and in some cases continues to be, extremely relevant. That said, even more relevant is the institution's participation at the various levels of decision making concerning protected areas.

A good example is the law regulating the national system of protected areas (Snuc). The subject of fierce debate throughout the 1990s, the bill for the law oscillated between a conservationist vision and a more innovative perspective that would take into account the various social players connected with protected areas, such as local communities, for example. WWF-Brazil actively participated in these debates and helped orchestrate the final result, which, despite not being everything it had hoped for, nonetheless represents a new legal benchmark that incorporates some of the desired advances<sup>19</sup>.

Another interesting example is Arpa, which originated from WWF-Brazil's efforts to have 10% of the Amazon designated as protected area – the subject of another article contained in this volume.

Lastly, also worth mentioning in the field of public policies related to protected areas is the institution's participation in drafting the National Plan for Protected Areas and in orchestrating the National Forum for Protected Areas. Both are initiatives in progress, derived from the commitment assumed by the signatories of the Convention on Biological Diversity to the Working Group on Pro-

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19. Those interested in knowing more about the debate on the Snuc law should consult Mauricio Mercadante's article entitled "*Uma década de debate e negociação: a história da elaboração da Lei do Snuc*" (A decade of debate and negotiation: the history of the drafting of the Snuc Law), published in 2002 in the book *Direito ambiental das áreas protegidas* (Environmental law in protected areas), edited by Antônio H. Benjamin and published by Editora Forense Universitária; or Juliana Santilli's "*Socioambientalismo e novos direitos*" (Socio-environmentalism and new rights) published in 2005 by the Instituto Internacional de Educação do Brasil – IEB, Instituto Socioambiental, ISA and Editora Peirópolis.

tected Areas. Each of these deserves a more detailed treatment, so we will begin with the Convention's Working Group on Protected Areas, which in many respects is the root of the other processes.

*The Working Group on Protected Areas of the Convention on Biological Diversity*

The Convention launched numerous working groups, most of which, however, did not have clearly defined goals, much less an established timeframe. This is perhaps one of the main reasons for the Convention's low degree of implementation. In 2002, at the Sixth Conference of the Parties, the governing body of the Convention, the decision was taken to create new instruments to make the Convention's implementation more agile. Perhaps partly as a result of this, by the Seventh Conference of the Parties, held in 2004, at which the Working Group on Protected Areas was instituted, more care was taken with the means for measuring the success of the program's implementation through the setting of clear goals and timeframes. That said, the initiative taken by NGOs on the occasion to seal a technical and financial pact to support the program transformed what would have been just one more string to the Convention into a new model that has become the standard by which other programs are now being revised. These NGOs – WWF, TNC, Conservation International, Birdlife International and the Wildlife Conservation Society, made a significant difference that day and have continued to do so by keeping their promise and by showing that, when well thought-out and backed by society, the Convention's programs stand a much greater chance of succeeding.

*The National Plan for Protected Areas*

At the beginning of 2005, based on the commitment the country had assumed through the Working Group for Protected Areas, Brazil began the process of drafting a National Plan for Protected Areas. This plan goes beyond the focus the Snuc – *Sistema Nacional de*

*Unidades de Conservação* (National System of Conservation Units) places on protected areas to embrace 'quilombo' land (former hide-outs for fugitive slaves) and indigenous territories as well. This process has received technical and financial support from WWF since the very beginning.

### *The National Forum for Protected Areas*

The Forum is an initiative from the Ministry of the Environment that aims to create a formal space for discussion on policies related to protected areas in Brazil. The Forum is made up of NGOs, government representatives and social movements. WWF-Brazil believes that this Forum is extremely important not only now, but in the medium and long term, and has continuously supported its constitution and functioning.

The items described above are directly related to protected areas, but WWF-Brazil has been working on various other political fronts relevant to the conservation of biodiversity, many of which are strongly linked to discussions on the forests and water resources, while others are less obviously so, such as those on climate change, trade and the energy base.

### **Beyond public policy**

It is becoming increasingly clear to WWF and other institutions working with the theme of the conservation and sustainable use of biodiversity that the only way to ensure a future in which there is a significant conservation of biodiversity and widespread rational use of natural resources is if the prevailing development model is called into question and alternative models are suggested.

This realization has translated into attempts to reflect upon and understand society's current dynamic and its various players, especially private companies. This sector's activities and its interaction with other sectors of society and with natural resources have made

it increasingly more important in the construction of more rational and balanced models of development.

The tendency is for these institutions to broaden the scale of their work in order to show how the good results obtained on their field projects can convert into significant recommendations in the discussion on the best paths to take in search of a sustainable planet.

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# Bioprospecting and the framework of the Convention on Biological Diversity: enterprising business in Brazil

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Antonio Paes de Carvalho

Home to approximately 22% of the vegetal biodiversity on the planet, Brazil looks for conservative and sustainable ways to transform its biodiversity into wealth.

Among the various economic activities that can combine conservation and sustainability (see the excellent presentation on the theme at the Conservation Finance Alliance website: <http://guide.conservationfinance.org/chapter/index.cfm?Page=1>), one of the most attractive is the search for new natural molecules capable of advancing health and wellbeing, agribusiness and environmental management, while minimising human impact. In each of these cases there are already international players that control the global markets and the state-of-the-art technologies that fill the needs of those markets. In each of these cases, the search for chemical innovations in biodiversity is just one of many lines of business, technological development and market innovation. The target of this search is and has always been the natural riches of the megadiverse countries, whose technological and scientific capacity is still not enough to aggregate significant value to their potential for natural production. These less developed societies tend to stick to primary extractivism, subsistence agriculture and revered ancestral habits of alimentation, hygiene and health. However valuable these ancestral habits may be, it is all too easy to lapse into the extreme of denying the possibility and even the existence of material progress based on Science.

It is not difficult to intuit the high probability there is that the chemical diversity of the more than 50,000 vegetal species found in Brazil harbour unknown and potentially interesting products over and above those provided by the little more than 1,400 vegetal species whose bioactivity can be found registered in classical pharmaceutical and biomedical science and tradition (see for example Mors, Rizzini & Pereira, 1999).

The biopharmacological potential of libraries of natural products has a somewhat oscillating track record. The uncontested base of pharmacology and the pharmaceutical industry up to the mid 1900s, the natural product as a source of pharmaceutical innovation was challenged and usurped by chemical synthesis, which freed production from climatic, seasonal and geopolitical factors.

Chemical Science continued to advance ideas and generate vast collections of new chemical structures that promised to bury forever the need to take recourse to nature. However, it soon became apparent that the number of new therapeutic products arising from Combinatorial Chemistry was piffling in relation to the growing cost of this type of research. New innovation paradigms began to appear, especially those derived from the recently acquired capacity afforded by IT and computerized molecular modelling technologies, which paved the way towards the important advances of "intelligent drug design". Yet even this, which promised to design the ideal drug for each active site of a biological target, ran up against the limitations of human intelligence when compared with aeons of vegetal experience in the development of small molecules capable of interacting defensively with the macro-molecular compounds of plagues and herbivorous animals out in search of food. These issues are masterfully discussed by Geoffrey A. Cordell, who concludes in favour of restoring an important role to biodiversity in the search for pioneering new molecules in conjunction with the range of technologies at the chemist's disposal (see *Phytochemistry* 55, 463-480, 2000; and *Phytotherapy Research* 15, 183-205, 2001).

This return to Nature in search of pioneering new molecules was reiterated in a cover report entitled "Rediscovering Natural



Products<sup>20</sup> that appeared in the October 13, 2003 issue of the well-known publication 'Chemical and Engineering News' (A. Maureen Rouhi, *Cenear* 81(41):77-78, 82-83, 86, 88-91). To say nothing of such classic vegetal molecules as aspirin, as recently as the period 1981/2002, the group at the National Cancer Institute showed that 61% of the 877 pioneering molecules used by the pharmaceutical industry took their inspiration from the active centres of much older natural molecules (David J. Newman, Gordon M. Cragg, and Kenneth M. Snader, *J. Nat. Prod.*, 66, 1022, 2003).

However, it is the new Biotechnology, based as it is on modern cellular and molecular biology and geared towards genetic engineering, that has raised the most recent hopes that we could maximise natural resources in a non-predatory way, basically availing of the informational content stored in animal, plant and micro-organic DNA (see the home page of JCVSF – The J. Craig Venter Science Foundation). Enormous effort and enormous expense on behalf of governments and the private sector led to the successful mapping of the human genome and its promise to unveil all in medicine and advanced therapies. But, once again, after the strain of the effort to get to know the human organism and its functional pathologies, we find ourselves facing the question of where those much expected gene saviours are after all. In practice, the pipelines of biotechnological products have proved a disappointment. Everything would seem to point towards our returning once more to the search for those little natural molecules that have always been able to interact with the complex proteins that result from genic expression; those small molecules that can transform into effective and easily administered treatments for the population. In other words, little molecules with immense business potential for the pharmaceutical industry.

The aim of this article is to show how all of this effort has been coloured with, and continues to be increasingly formatted by, the vision of countries like Brazil, which adhered to the Convention on Biological

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20. <http://pubs.acs.org/cen/coverstory/8141/8141pharmaceuticals.html>.

Diversity as a way of guaranteeing that the essential conservation of the surviving genetic heritage is counterbalanced with virtuous flows of capital and technical/scientific training capable of generating sustainable development and wealth for the Brazilian society as a whole. Our intention is to demonstrate this in the light of the creation and activities of Extracta Moléculas Naturais S/A, a private Brazilian technology company set up by Brazilian scientists to search for innovative natural molecules in Brazilian biodiversity in strict partnership with its industrial clientele both at home and abroad. The company's business model was intentionally constructed to add a new twist to the CBD: a local technological mediator capable of transforming the will-to-innovate of large industry into concrete projects bolstered by the contribution of a growing scientific community naturally ambitious to participate and profit on the grand stage provided by the Convention, the "leitmotif" of whose future greatness and importance for mega-diverse countries was the exchange of access for diffuse and loosely defined economic benefits.

### The creation of Extracta and its business with GlaxoWellcome in 1999-2002

Extracta was opened in 1998 as a private Brazilian technology company located in the Rio de Janeiro Biotechnology Complex, a scientific/industrial park installed on the campus of the largest scientifically-based federal university in the country. Extracta's *modus operandi* in searching for bioactive molecules in nature was strictly crafted on the basis of the Convention, signed by Brazil and promulgated as law through Decree 2.519/98. The company also studied the Bills of Law in process for the most exacting requirements for access to and the use of renewable natural resources considered genetic heritage. The company then set about amassing a large collection of natural products in extract form upon which it applies conventional high throughput screening and bio-directed chemical fractioning techniques to isolate molecules hitherto undetected in chemicals

occurring in Brazilian nature active against the fine biological targets proposed by its industrial clients.

Relatively quickly, in July 1999, Extracta managed to sign an important collaborative research contract with GlaxoWellcome, considered the biggest of its kind south of the Equator at the time (“\$3m deal launches major hunt for drug leads in Brazil”, Ricardo Bonalume Neto & David Dickson, in *Nature*, London, July 22, 1999). The general structure of the contract established that GW would cover the full costs of Extracta’s research and collaborate extensively on the technical/scientific level during its execution (carried out entirely in Brazil) in return for first-option rights to take out Brazilian patents on novel molecules and to charge royalties on the worldwide commercialisation of the resulting products by the client.

The contract with GW worked extremely well, with intense and highly satisfactory interaction between the teams. Knowledge of good laboratory practices and related technologies were adopted and Extracta invested in equipment and installations to be able to fulfil its side of the contract, all of which resulted in introducing methods and techniques to Brazil that remain unique in Latin America to this day.

In Brazil, the diffusion of unrestricted knowledge and technologies stemming from the Glaxo contract was extremely relevant. In addition to direct alliances with scientific groups from the Federal University of Rio de Janeiro (UFRJ), Extracta also sealed a contract with the Federal University of Pará (UFPA), which led to Extracta’s investing in an Extraction Centre identical to that at the headquarters in Rio de Janeiro, which it constructed, equipped and ran for the period of two years exclusively with its own financial resources. At the end of the exercise, the assets and staff were absorbed by UFPA, where they continue to function, serving as the basis for new access contracts and the formation of a specialised personnel based in Belém.

Extracta put together a system of access based on the granting of prior informed consent by the owners of the land in return for participation in the future financial benefits from the commercialisation of any products arising from those properties. All of Extracta’s suppliers are either the owners of the lands in question or are recognised

as the permanent occupants through their use of that land or traditional settlement on it.

Having grasped the numerical discrepancy between the 60,000 known species of plant and the some 1,400 species catalogued as traditional knowledge, Extracta developed a collection strategy utterly divorced from that knowledge. The company's 183 excursions covering more than 10,000 km<sup>2</sup> of biodiverse territory have sought all of the plants for which the existence of fertility (flower, fruit or seed) allows for precise taxonomical classification. All of the plants collected now find themselves geo-referenced by GPS and faithfully catalogued in public herbariums, with photographic documentation archived on the company's database and available for scientific consultation through the RFA Herbarium of the UFRJ Institute of Biology and the Herbarium of the Museu Paraense Emílio Goeldi. Extracta does not, therefore, deal with information associated with traditional knowledge and its methods for detecting bioactive substances are entirely based on *in vitro* tests using modern bioassays as agreed with its clients. This approach in no way questions the value of traditional knowledge, but is merely a response to the concrete fact that the legal framework for negotiations with traditional populations in Brazil and other parts of the world remains complex and unstable.

The GW/Extracta contract was concluded in 2002 with the isolation of ten natural bioactive compounds characterized as inhibitors of the Elastase 7 enzyme and the growth of virulent methicillin-resistant strains of *Staphylococcus aureus*. The contract was not renewed by the in-coming scientific board after the merger between GW and SmithKlineBeecham (now GSK), which decided upon new directions in its search for molecular innovation for its pipeline. The results obtained remain the isolated property of Extracta and the company is currently open to negotiating the commercialisation rights.

Although it has not yet resulted in the launch of any products on the market, the GW-Extracta contract reveals two important model aspects. Firstly, both in Brazil and abroad, the business format was considered a model structure entirely suited to the principles of the CBD, allowing for international access associated with the transfer

of technology, financial resources and internal diffusion within Brazilian academia, with considerable potential for the generation of personnel and concrete benefits. Secondly, it showed that Brazil knew how to respect a perfect legal measure. Contracted in 1999, prior to the issuing of the current Brazilian regulatory documentation on access to genetic heritage, which later all but paralysed all of the access initiatives in Brazil, which are only now marching towards a satisfactory resolution for the stakeholders, the parties still managed to fully execute the GW-Extracta contract without impediments in the midst of all these legal changes.

### Consequences for Extracta of the access regime established in Provisional Measure 2.186-16 of 2001

Despite already having a large collection of plant extracts at its disposal when the mechanisms of the new legislation came into effect, Extracta found itself faced with the arduous task of acculturating Brazilian science and public administration to a complex work whose improper functioning could expose all involved – scientists and businesspeople of good faith – to accusations of biopiracy. The inflexible wording of the legal text was extensively complemented by interpretive instruments that served only to further complicate the restrictive context, and the clouds are only now beginning to lift. A great deal of work went into having the intention to fully comply with the letter and spirit of the CBD couched in regulatory legislation that was effective in curbing abuses, but nonetheless attractive to the fundamental matter of aggregating value to Brazilian genetic heritage.

Thanks to these efforts on behalf of all concerned, in June 2004 Extracta became the first private Brazilian company to be awarded a special licence for extensive access to Brazilian biodiversity with the purpose of mounting an extract library for commercial ends (Deliberation nº 62, of June 22, 2004, of the Genetic Heritage Management Council). This permit enabled Extracta to reopen its original



business plans and set out in search of a renewed clientele in a technical/scientific environment now very different from that of 1998.

It will be well worth the effort to accompany the evolution of Extracta, which has been practically reborn in this new context. The positive inflections of its new business, which can be followed through the site [www.extracta.com.br](http://www.extracta.com.br) (bilingual), serve as a barometer for compliance to the new Brazilian regulations for the sustainable use and conservation of our genetic heritage. With the Brazilian and international business community as fundamental partners in this new phase, Extracta's founders and investors continue in their absolute conviction that enormous benefit to Humanity in terms of health, food and environmental conservation lies hidden and untouched in our biodiversity, constituting considerable opportunities for all.



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# Conservation of biological diversity and fire control on small Amazonian properties

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Oriana Almeida, Lucimar Souza and Liana Rodrigues

## The Convention

The Convention on Biological Diversity (CBD) was ratified by the Brazilian government in March 1998<sup>21</sup> and it has taken its place alongside the United Nations Framework Convention on Climate Change and the Forest Declaration, the most important commitments approved during the United Nations Conference on the Environment and Development (Rio-92), as one of the main instruments adopted by the international community in the promotion of sustainable development.

By establishing obligations for its contracting parties, the CBD took the innovative step of making technical and scientific cooperation<sup>22</sup> one of the elements of its implementation. This cooperation is not restricted to mere collaboration among States, but above all among social entities, whether companies or civil society as represented by non-governmental environmental organizations (NGOs) working with diverse areas of sustainability. It must be stressed that, while the Brazilian State has the obligation to deliver on its commitment to the CBD, it falls to NGOs to assume a complementary role with each effort they make to implement the convention's goals.

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21. Decree nº 2519, of March 16, 1998.

22. CBD, Article 18.

## Ipam

The mission of *Instituto de Pesquisa Ambiental da Amazônia* (Amazonian Environmental Research Institute), a Brazilian NGO founded in 1995, is to contribute to a process of development in the Amazon that meets the social and economic aspirations of the population while maintaining the functional integrity of the region's ecosystems. Ipam strategy is based on research to formulate an understanding of the environmental reality, demonstrative projects that seek viable solutions and the dissemination of results and provision of environmental management training for local agents. Research has always been Ipam's first step in starting its projects and this has resulted in 260 publications, including 125 articles published in scientific journals, 40 book chapters, 13 books, 24 primers, 26 miscellaneous publications and 40 texts in support of medium-and large-scale events. Ipam has also supported 50 doctoral and masters' degree theses and graduate dissertations.

The focus of Ipam's work has been on Forest Ecology, with special emphasis on regeneration and the impact of forest fires and drought on the ecosystem; Future Scenarios for the Amazon, projecting various alternative deforestation scenarios; Forest and Community Projects, seeking sustainable solutions at the level of small rural production; the Meadowlands Project, focused on the integrated management of meadowland natural resources; and Good Production Practices, which aims to promote the introduction of best practices through economic incentives.

### The Good Fire Management Project

Fire has become one of the greatest environmental risks for the Amazon. Sweeping forest fires can eliminate up to 80% of ground-level forest biomass and cause severe impact on fauna. This type of fire kills a large number of trees and increases the forest's susceptibility to further fires, thus contributing to a vicious circle whereby the more often the vegetation is burned, the more vulnerable to fire it

becomes with each passing dry season. The end result is that Amazonian forest landscapes are becoming more fire-prone each year, furthering the progressive degradation of the forest (Nepstad et al. 2005).

Data from the *Instituto Brasileiro de Geografia e Estatística* – IBGE (Brazilian Geographical and Statistical Institute) cattle farming census of 1996 showed that there are more than 600 thousand farming families in the Amazon. If each family were to clear 2 hectares for planting each year, this would amount to 1.2 million hectares intentionally slashed and burned. Our studies also show that an area of the same size will be burned accidentally. These estimates show just how enormous the potential impact of fire upon Amazonian forest really is.

In a bid to reduce the impact of fire on this population, Ipam set up the “Good Fire Management” project for community fire management. The project is the result of an initiative on behalf of the Del Rey community in the municipality of Paragominas, which suffered various forest fires in 1991-92 caused by a combination of lumbering activities, which left the forest vulnerable, an intense drought that occurred during the period and farming fires that spread from the settlement plantations into the forest. The community suffered heavy losses as a result of these wildfires. More than 90% of the settlement properties were invaded by accidental fires, burning woodland, brushwood and plantations. Ipam technicians worked with the community to develop mechanisms to reduce the incidence of accidental fire through a community agreement that specifies a series of simple measures the farmers have to follow to prevent fires spreading from their plots. A fire brigade was also set up to fight accidental fires.

During the work with the community of Del Rey, a methodology was created in conjunction with 20 other communities in the region of Belterra and Paragominas (Pará), involving the following steps: 1) initial diagnosis through the application of a questionnaire on fire use and history of accidents; 2) meetings to present good fire management practices and discuss the techniques to be applied by the communities; and 3) evaluation of the efficiency of these techniques in avoiding accidental fires.

The introduction of this new methodology and the new fire control techniques with 300 farmers in 1996 showed that it was possible to reduce accidental fire by 75% when compared with the incidence of fires in years preceding the implementation of the projects in these communities. This change of behaviour in terms of fire use demonstrated the enormous potential that exists for reducing the impact of accidental fires on small acreage properties. Though the impact of forest fires in the Amazon remains enormous, these experiments show that the potential of fire management is likewise huge. Through education and the dissemination of fire prevention techniques, the solution to accidental fire rests in the hands of the 600 small farmers, who together represent a capacity to reduce the area affected by accidental burnings by more than one million hectares, thus promoting the conservation of the region's biodiversity.

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# The speed of innovation and the forest's own time – An experience

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Fernanda Pompêo de Camargo Ferraz

## Introduction

On March 18, 2005, the Official Government Journal (*Diário Oficial da União*) published Deliberation nº 94, of February 24, 2005, of the Genetic Heritage Management Council, according to which a national cosmetics company was granted access to the genetic heritage of *Protium pallidum*<sup>23</sup>, known as “Breu Branco”, for the purpose of bioprospecting and technological development.

Seven years after the issuing of Decree nº 2,519, of March 16, 1998, which promulgated the Convention on Biological Diversity<sup>24</sup>, this was the first time access that had been granted for the purposes of bioprospecting<sup>25</sup> and technological development<sup>26</sup>, consolidating a partnership between a traditional community, a private company and a state government.

One peculiar characteristic of this process was the moment of its authorization. Contrary to the requirements of the prevailing legislation, this authorization was only granted after the commercialisation of the product. The reason for this was that the legislation had not been in vigour at the time access was made. The beginning of the

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23. “Breu Branco” (*Protium pallidum*), from the botanical family *Burseraceae*, is a resinous and aromatic Amazonian plant.

24. The Convention on Biological Diversity was signed during the United Nations Conference on the Environment and Development held in Rio de Janeiro – RJ (Brazil) in 1992.

25. Bioprospecting: exploratory activity which aims to identify genetic heritage and information on associated traditional knowledge with potential for commercial use. Article 7, VII Provisional Measure 2186-16/2001.

26. Technological development: Systematic work based on existing knowledge that envisages the production of specific innovations, or the development and/or modification of existing products or processes, for economic applications. Article 1 of Technical Orientation nº 4 of the Genetic Heritage Management Council, May 27, 2004.

research just happened to coincide with the issuing of Provisional Measure 2186-16/2001<sup>27</sup>. However, this *a posteriori* authorization in no way compromised the parties involved. The transparency of the relations and the bases they had hitherto consolidated were the main differentials in the success of the negotiation.

Another differential was the mutual respect the parties involved showed for pre-established partnerships. The community was able to count on the support of non-governmental organizations and independent professionals, who proved fundamental during the structuring of the approval process, while, for its part, the cosmetics company relied on partners in the area of research and development and from its productive chain, all of whom were presented to the community and included in the negotiations. Representatives from the Secretariat for the Environment of Amapá, the stage for these events, were present at all times throughout the negotiations.

In parallel, accompanying discussions with CGEN – *Conselho de Gestão do Patrimônio Genético* (Council for the Administration and Management of Genetic Heritage) was fundamental to a better understanding of the organ's assessment of the basic structure of the Contract for the Use of Genetic Heritage and Benefit Sharing.

The crucial point of the whole process was the matter of where access to the genetic heritage had taken place. At the time, it was not possible to establish the place of access with absolute certainty. This uncertainty greatly modified the matter of the community's right to a share of the benefits. However, given the constructive spirit of the parties involved, this barrier was eventually overcome.

There was also a great deal of reflection on the associated traditional knowledge. In addition to there being no doubt that this specific community was the holder of accumulated knowledge on the uses of "Breu Branco", it was also recognized that it possessed traditional knowledge on the management of the species. The problem was finding a legal solution that could make the business viable.

27. Published in the Official Government Journal on 24/08/2001.



The benefit sharing was agreed in contract between the two parties in a manner that reflected the sense of the partnership. Central to the issue were the benefits for the community. The negotiations also sought to take into account the investments the company had already made in the community over the course of the partnership, as well as the medium-and-long-term benefits. The share of the benefits for the state of Amapá was also considered.

The aim of this article is to relate in a constructive manner a case in which the obstacles presented by the winding paths of legislation, a lack of experience with negotiations of this magnitude, shortage of successful precedents within the scope of the Provisional Measure and the travel and logistical difficulties involved were all overcome through the good will, spirit of partnership and construction and, above all, the passionate vision of all concerned. This last point was perhaps the key to making this little piece of history.

## Characteristics of the parties involved

The case under analysis involved three main parties: the community of São Francisco do Iratapuru, responsible for collecting the biological material for research and the bearers of the traditional knowledge associated with the genetic heritage; the State of Amapá, owner of the area in which access to the genetic heritage was made, and a cosmetics company, responsible for the bioprospecting and development of products using "Breu Branco".

### *The community of São Francisco do Iratapuru*

This community consists of 27 families and 173 individuals – counting adults and children – concentrated in a small village near the falls of the Iratapuru River, on the right bank of the Jarí River and in the municipality of Laranjal do Jaro in Amapá. Before the creation of the Sustainable Development Reserve (SDR), these families were dispersed at some distance from each other along the banks of

the Iratapuru River, as is the typical way of life in traditional extractivist areas. In 1992 they decided to settle the village and organize Comaru – the Mixed Cooperative of Producers and Extractivists of the Iratapuru River. The village is situated in the environs of the protected area, but the community's economic activities have always been conducted on territory inside the SDR<sup>28</sup>.

In addition to supplying the “Breu Branco” used in the research, the community also provides Brazilian chestnut, Copaíba oil and “Breu Branco” resin for the production of cosmetic products.

Comaru was selected to represent the community throughout the course of the negotiations. It must be stressed that, regardless of the legal character of Comaru, the rights of the community of San Francisco were respected at all times during the process. This was a premise identified from the beginning of the negotiations and maintained throughout the authorization process and the subsequent partnership.

### *The State of Amapá*

Located in the far north of Brazil, Amapá boasts a vast amount of preserved forest cover. Its area of 143,453.7 km<sup>2</sup> is home to a rich diversity of ecosystems including dry-land forests, flooded forests, savannah, periodically flooded riverine woodland and mangroves. Amapá borders on the State of Pará, the countries Suriname and French Guiana and the Atlantic Ocean. The State has one of the lowest rates of removal of vegetal cover in Brazil and, in addition to the indigenous lands<sup>29</sup>, 55.17% of its territory has been converted into protected area.

On December 3, 1997, Amapá instituted a precursory form of Law 388, which rules upon the instruments and controls for access to the State's biodiversity. On December 11 of the same year, State Law 0392 created the Iratapuru River Sustainable Development Reserve.

28. Text taken from the Anthropological report drafted by Mary Helena Allegretti in July 2004.

29. Source: website of the Secretariat for the Environment of the State of Amapá, consulted on 11/9/2005.

The Iratapuru SDR covers an area of 806,184,444 hectares and is situated in the southeast of the State in the municipalities of Laranjal do Jari, Mazagão and Pedra Branca do Amapari. The region has a hot and humid climate, with average temperatures of between 28 and 30 degrees Celsius. The most predominant vegetation is that typical of dry-land forest: high in economic value, rich in biodiversity and home to large species. The Iratapuru SDR is run by the Secretariat for the Environment of the State of Amapá in partnership with its Managing Council<sup>30</sup>.

### *The cosmetic products company<sup>31</sup>*

Founded in the city of São Paulo in 1969, it has a production unit and research centre in Cajamar, in the southeast of São Paulo State. The company has a staff of approximately 3 thousand employees and adopts a direct sales model, with a sales force of 450 thousand autonomous professionals (called 'consultants') nationwide, bringing its products to the end consumer. It operates in Argentina, Chile, Bolivia, Peru, France and Mexico. In 2004, the company opened its capital on the São Paulo Stock Exchange (Bovespa) New Markets Index, registering a turnover of R\$ 2.5 billion and R&D investments of R\$ 47.4 million. A benchmark in its history occurred in 2000, with the launch of a product line whose technological platform is the use of Brazilian biodiversity.

## The authorization process

### *The moment of authorization*

The end of 2003 and beginning of 2004 were marked by the regulation of part of Provisional Measure 2,186-16/2001 by the

30. Source: website of the Secretariat for the Environment of the State of Amapá, consulted on 11/9/2005.

31. Source: Annual Report 2004 – Natura.

Genetic Heritage Management Council. Twelve resolutions were published during this period, including those establishing the guidelines for obtaining prior consent and drafting contracts for the use of genetic heritage and benefit sharing. Four technical orientations were also published, including Technical Orientation nº 4, which clarifies the meaning of the term "Technological Development".

It is also important to mention that Decree 4,946 of December 31, 2003 was also published during this period. This decree altered, revoked and added clauses in/to Decree nº 3,945 of September 28, 2001<sup>32</sup>, which regulated Provisional Measure nº 2,186-16 of August 28, 2001. Only after this regulation was it possible to establish the minimal legal framework needed to start formalising negotiations with the Iratapuru community and the State of Amapá.

It must be remembered that, throughout the entire process, there was no precedent for the involvement of traditional communities with the activities of bioprospecting and technological development approved by the CGEN that we could take as our guide in determining the legal routes to follow.

The formal request for access to the genetic heritage pertaining to "Breu Branco" was made in July 2004, after the products had already reached the market. This *post facto* authorization did not result in any losses for the parties involved.

Making an optimistic analysis of the situation, without in any way meaning to discourage compliance with the law, we understand the *a posteriori* nature of the regularisation of the case to have actually been a positive factor insofar as, during the process to obtain prior consent and the signing of the Contract for the Use of Genetic Heritage and Benefit Sharing, the parties involved were able to attain greater clarity as to their rights and obligations in the light of the legislation. This process also gave the relationship of trust between the parties time to mature.

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32. Decree 3945/2001 was amended by Decrees nº 4,946/2003, nº 5,439/2005 and nº 5,459/2005.

## *Form of the negotiations*

The negotiations were based on the premise of transparency, ethics and a necessary process of clarification and adaptation, respecting, above all, collective organization.

As such, the entire negotiation process was conducted alongside the Iratapuru community – which democratically elected and presented its representatives – and the State of Amapá, through representatives from the Secretariat for the Environment.

The methodology was essentially expositive, involving assemblies held with the community and the later formalization of the documents. The partners from the community had access to e-mail and some documents were forwarded to them before the talks began.

Some meetings needed to be held in Macapá, the state capital of Amapá, to discuss the interests of the Secretariat for the Environment in its capacity as manager of the Conservation Unit. The company managed to orchestrate the presence of the community leaders at these meetings, whose participation was considered fundamental. Just as the company was received by the community on its home soil, it also welcomed the community leaders and government representatives at its installations in São Paulo.

When the time came to sign the Terms of Consent and the Contract for the Use of Genetic Heritage and Benefit Sharing, the document was read in full in the presence of all parties, followed by the clarification of any doubts. There was also special care taken with “translating” the legal terminology. In addition to the company’s clarifications, the community also counted on its own independent partners, who provided the necessary support in this respect.

The principles of the partnership, the research project and the sharing of the benefits were presented and discussed at a series of meetings.

The dynamic of the meetings was exhausting both for the company’s representatives, who had to travel long distances, and for those of the community, who were not used to the intense pace of the visits. The

meetings were held during one period of the working day, in the form of assemblies, occasionally followed by closed discussions among members of the community. During these private moments, the visiting delegation was received in the kitchen to sample the delicious local food. If the time allotted was not enough for reflection and consensus, the delegation returned some days or weeks later.

The process of discussing the Terms of Consent and the Contract for the Use of Genetic Heritage and Benefit Sharing was arduous and interspersed with moments of tension in which the jargon was not understood and dialogue proved difficult, but the spirit of construction and the pursuit of practical and positive results for all always prevailed.

#### *Importance of the independent consultants and organizations*

The role of the “mediators” was of the utmost importance in this relationship. The negotiation process was accompanied by a non-governmental organization with a prior relationship with the community and by consultants selected by the community itself.

The role of these groups was to balance the relationship between the parties and to legitimise the principles that guided it. Above all, they acted as translators in this relationship and managed to establish a beautiful equilibrium between the forest’s own time and the speed of innovation.

#### *The issue of the place of access*

The location at which access to genetic heritage is to be made is a central aspect in defining the legal terms of an access authorization agreement, principally as one of the negotiating parties – the provider – is determined by the profile of the locale, particularly in terms of its ownership.

It is important to confirm that the owner of the area in which the collection takes place is the individual/entity named as the provider of the genetic material, as it is with the holder of the deeds of



ownership that the Prior Informed Consent must be secured and the Contract for the Use of Genetic Heritage and Benefit Sharing be negotiated and signed.

Articles 16, § 9, and 27, of MP 2186-16/2001 respectively establish that:

“The Authorization of Access and Transport/Shipment is given after Prior Consent:

I – From the indigenous community involved, through the official indigenist organ, in cases where access takes place on indigenous lands;

II – From the competent organ in cases where access takes place in a protected area;

III – From the owner of private land in cases where access takes place thereon;

IV – From the National Defence Council in cases where access takes place on land indispensable to national security;

V – From the marine authority in cases where access takes place in waters under Brazilian jurisdiction, on the continental platform or in an exclusive economic zone.”

“The Contract for the Use of Genetic Heritage and Benefit Sharing should clearly state and qualify the contracting parties, namely, on the one side, the owner of the public or private land, or the representative of the indigenous community and the official indigenist organ, or the representative of the local community, and, on the other, the national institution authorized to effect such access and the institution for which the material is destined”.

In the case of access to “Breu Branco”, there was great difficulty in establishing the exact location of access. As already mentioned, the legal procedures were followed after the samples used in the research had already been collected.

The community has traditionally availed of the riches of the region's forests, but never in a manner that strictly observed the boundaries between the Reserve and its surroundings.

It must not be forgotten that the Iratapuru SDR – created before the law (9,985/2000<sup>33</sup>) that instituted the National System of Conservation Units – does not have a Stewardship Plan<sup>34</sup>, nor does it have regulations on possible activities or restrictions concerning its surroundings<sup>35</sup>.

From the beginning of the negotiations, all possible parties to the contract were involved, though the exact location at which the access had been made could not be pinpointed with absolute certainty. After long interviews with the community, it was understood that the “Breu Branco” sample most likely came from their region (i.e. from outside the bounds of the SDR), thus establishing the community of São Francisco do Iratapuru as the provider.

However, as it was known that the community did not possess the deeds of ownership of the land, great care had to be taken to prove possession, which is a prerequisite for any request for access.

The community leaders could recall a specific and dated event at which, in the presence of government representatives, the “land” had been handed over to the community. They were sure that a document existed that could legitimise their possession, at least pending agrarian regulation by the Amapá Land Institute. This document was requested and the community promised to locate it. In the meantime, the negotiations continued, resulting in the definition of the Terms of Consent and the drafting of the Contract.

However, after the protocol for the process was issued by the Genetic Heritage Management Council (CGEN), the first doubts

33. Art. 225, paragraph 1, items I, II, III & VII of the Federal Constitution instituted the National System of Nature Conservation Units, among other measures.

34. Stewardship Plan: technical document which establishes the zoning and norms that will preside over the use of an area and the management of its natural resources in accordance with the general objectives of a conservation unit, including the implantation of the physical structures needed for the management of the unit. – Art. 2 item XVII of Law 9985/2000.

35. Buffer zone: the area surrounding a conservation unit, in which human activity is subject to norms and specific restrictions with a view to minimising any negative impact on the unit.

began to arise as to the true place of access. The community never did manage to find the above-mentioned document, despite numerous attempts to do so. Surprisingly, at the same time, the Secretariat for the Environment of the State of Amapá presented the executive Secretary of CGEN with documents proving that the “Breu Branco” had been accessed inside the SDR.

We therefore returned to the State of Amapá, where, in conjunction with representatives from the São Francisco Community, an adjunct to the contract was negotiated whereby the Secretariat for the Environment of the State of Amapá, the managing organ of the Conservation Unit, was included as a further party to the contract. The share of the benefits due to the State of Amapá was also decided on this occasion.

It must be stressed here that the signing of the adjunct was only possible because all of the parties had been involved and well informed from the very beginning of the negotiations. The signing of the contract rendered official the legal relationship between the State of Amapá, the São Francisco Community and the private company in question.

## Benefit Sharing

### *The sharing of the benefits arising from access to the associated traditional knowledge*

Discussions about access to associated traditional knowledge were an important mark in the negotiation process on the granting of access and subsequent sharing of the benefits.

The “Breu Branco” was accessed in resin form. Knowledge about the use of resins for the purposes of perfumery goes back to pre-historic times, when man used to burn wood and resins to improve the taste of his food. The word perfume itself comes from the Latin “*per fumum*” or “*pro fumum*”, meaning “from smoking” or “through smoke”. The practice of fumigating environments by burning resins

is historically related to religious practices<sup>36/37</sup> and references can be found in the Greek, Egyptian, Indian, Roman and Arabian cultures. This practice is commonly associated with purification and cleansing.

As can be gathered from the anthropological report drafted on the occasion of the signing of the Terms of Consent, the community of Iratapuru used the “Breu Branco” resin for the purposes of perfumery:

“At the meeting held on April 22, 2004 at the São Francisco do Iratapuru community, two people, Delbanor Melo Viana, known as Arraia, and Sebastião Freitas Marques, known as Sabá, mentioned the customary uses of “Breu” traditionally known all throughout the Amazon: for caulking boats, starting fires, lighting and as mosquito repellent. In addition to these uses, they also affirmed that “Breu” resin was customarily used to perfume the body while travelling in the forest...”

It was beyond doubt that there was a body of traditional knowledge associated with “Breu Branco”; an intrinsic knowledge, even if its effective contribution to the intended research was still questionable, considering the history of the use of resins for the purposes of perfumery worldwide.

It became clear during the process that, in addition to the knowledge associated with the use of the species, there was also traditional knowledge related to its management. It was therefore verified that references to this knowledge were to be readily found among the most diverse populations in areas where “Breu Branco” occurs.

The characteristics that define traditional knowledge, such as its oral transmission, a lack of definition as to the origins of the practice and, principally, the collective appropriation of the knowledge, were all present in the community.

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36. Some passages of the Holy Bible make reference to perfumery. One elucidative passage is that in which Esther speaks of the preparation of virgins for the King's harem: “six months with oil of myrrh, and six months with sweet odours and with the things for the purifying of the women” [Ester 2:12-13]. Another Biblical reference from the New Testament refers to the offerings brought by the Three Kings to the baby Jesus: incense, frankincense and myrrh.

37. Myrrh – A resin extracted from a small tree native to the Middle East. This resin was customarily made into an agreeable perfume and into a medicine that served as a tranquilliser when mixed with wine. (Matthew 2:11)

This last principle stonewalled the discussions. The issue referred to a collective right, though it was not possible to clarify the range of that collectivity. Moreover, it instilled the doubt as to how to find a representation sufficiently ample to embody the wishes of that collective group. There was legislation in place with clearly defined principles that were, at that moment, impracticable.

Recognition through the Convention on Biological Diversity was thus adopted as a premise; that is, the recognition of the strict dependence of the local communities and indigenous populations upon the biological resources and the need to share the benefits arising from the use of their traditional knowledge.

Article 8, item “j” established that:

“Each Contracting Party shall, as far as possible and as appropriate and subject to its national legislation, respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices”

In terms of national legislation, Provisional Measure 2186-16/2001 defines the concept of associated traditional knowledge<sup>38</sup> and devotes a chapter to its protection.<sup>39</sup> Referring to benefit sharing, Article 9, III (single paragraph) establishes that “The indigenous or local communities that create, develop, hold or preserve traditional knowledge associated with the genetic heritage are guaranteed the right to [...] obtain benefits through the economic exploration either directly or indirectly by third parties of any knowledge whose rights

38. “Art. 7 – Associated Traditional Knowledge: any information on individual or collective practice of indigenous or local communities related to genetic heritage that has either real or potential value”

39. Chapter III – From protection to associated traditional knowledge.

are under their ownership” and that “any traditional knowledge associated with the genetic heritage can be considered as under the ownership of a community if so much as one member of that community holds that knowledge”.

Once it was established that the protection of associated traditional knowledge and the receipt of benefits arising from its exploration are rights that pertain to the holders of that traditional knowledge, the key issue then became the problem of how to identify those holders – a task that appeared all but impossible.

The alternative that seemed the fairest at the time and that expressed the wishes of the community and of almost all of the partners involved was that a share of the benefits should indeed go to the community.

However, a legal risk analysis of this issue from the investment perspective, plus analyses of the economic risk and the very sustainability of the business itself, indicated that this alternative would not be viable.

Sharing the benefits arising from access to the traditional knowledge associated with “Breu Branco” with the Iratapuru community, insofar as there was no distinction under the prevailing law between the provider of the knowledge and the holder of that knowledge, would have opened the floodgates for any holder of the same knowledge to claim his or her share of the benefits deriving from the commercialisation of products using the “Breu Branco” resin.

In the end, after lengthy discussions with the community and faced with the evident impossibility of sharing the benefits arising from the access to their associated traditional knowledge, the consensus was reached that the benefits that would result from the partnership celebrated between the company and the community were sufficient to mitigate this legal risk.

From the legal perspective, the matter was resolved with the addition of a contractual clause in which both parties recognised that the ownership of traditional knowledge associated with Breu Branco was diffuse in nature and that the sharing of the benefits from that ownership must therefore occur in a similarly diffuse manner, pending regulation under Brazilian legislation. However, to this day, no such regulation has been forthcoming.



## *Sharing the benefits*

The most arduous part of this process was defining the bases for the sharing of the benefits, not only because of the subjective nature of the guiding principle – that it be “fair and equitable<sup>40</sup>” –, but also because of the lack of prior experience upon which to draw.

The parties sought to establish a format based on criteria for the short, medium and long terms. Right from the earliest negotiations with the Secretariat for the Environment of the State of Amapá, its representatives made it expressly clear that they wanted the community to reap the greatest benefit from the relationship.

The community of São Francisco do Iratapuru decided to prioritise investment in the productive chain of the Brazilian chestnut, a traditional source of income for the community and the focal activity of Comaru. At the time, the community was interested in reconstructing a biscuit factory in the area that had been destroyed by fire.

For the cosmetics company, supporting investment in the chestnut productive chain was also of interest, as demand for products containing that active principle was growing at the time and, without further investment in the area, the community was not going to be able to meet the following year’s demand for sustainably extracted chestnut oil.

It is important to mention that the relationship between the parties had already involved some investments for sustainable development and these investments were immediately recognised as benefits (and it could not have been any different). The foundations for the negotiations were therefore laid.

Prior to defining the proposal and the respective sums, the community was introduced to some concepts related to the process

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40. “The objectives of this Convention, to be pursued in accordance with its relevant provisions, are the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding”. Article 1 of the Convention on Biological Diversity, promulgated by Decree nº 2,519/98.

of innovation in the cosmetics industry, as well as some basic financial concepts, such as net turnover and profit.

Finally, after lengthy negotiations, a fixed sum was established for the community as a short-term benefit. As medium- and long-term benefit, it was agreed that the community would become the cosmetics company's sole supplier of "Breu Branco". The package also included investments to have the part of the SDR worked by the community certified for sound forestry management. This last measure was also considered as a benefit for the Secretariat for the Environment of the State of Amapá, the managing organ of the conservation unit and the agent responsible for obtaining the certification.

The community also received rights of access to a fund into which a percentage of the net income from the sale of products containing "Breu Branco" was to be deposited for as long as the community continued to supply the material.

The next step was to formalise the contractual format for access to the fund, considering the following premises: (i) the parties were to jointly establish projects in the area based upon the community's preliminary analysis of its vision for the future; (ii) the figures paid into the fund had to be subject to the proper accountancy and subsequent audit approval; (iii) the parties reserved the right to contract other partners and to develop projects for other complementary sources of financial and non-financial resources.

Considering that the contractual format would be unworkable in terms of sharing the benefits, the parties opted to set up a cooperation agreement between the company and the community. This document was included as part of the process for the authorization of access to "Breu Branco".

The benefit agreed for Amapá consisted of the promotion of the State's natural and cultural riches and its policies for the conservation and the sustainable use of biodiversity via the company's national and international advertising campaigns.

## Unfolding of the process

The authorization process remained under the consideration of the Executive Secretary of the Genetic Heritage Management Council (CGEN) for more than eight months. Numerous clarifications were requested and various demands made during this period, all of which were given and met. From the beginning of the negotiations to final publication of the authorization in the Official Government Journal, the entire process took one year and seven months.

In function of Amapá legislation, the same procedure was carried out at the state level.

## Conclusion

The experience related in this article deserves attention less for its form or pioneering spirit – particularly as it would be too bold a statement to claim that this was something completely new –, but because the parties sought to formalise the business within the framework of the prevailing legislation.

It would be important for Brazil to accumulate more processes like that carried out for access to “Breu Branco”, but the truth is the complexity of the prevailing legislation serves to discourage investment in the pursuit of legality. Today, for those who do not have the investment capacity or infrastructure needed to shoulder the high transaction costs of this model, the only alternative is to act outside the bounds of the law; and that is without counting all those who are simply ignorant of the laws that govern this complex and as yet fledgling process.

We do not mean to say that the establishment of a regulatory benchmark is impossible, especially as there already are a handful of initiatives in this regard, which are almost always conducted at the cost of great human effort and considerable financial expense.

However, there is pressing need for such a legal benchmark, one that is effective in securing the rights of traditional populations, the

generation of associated traditional knowledge and the sustainable use of natural resources, thus stimulating the generation of knowledge and technologies and financial return for the nation and its people.

This change is urgently needed if Brazil is to cease to be known simply as a “megadiverse” country and establish itself as a “mega-entrepreneur” in the sustainable use of its bio- and socio-diversity.

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# The role of the forestry sector in conserving the biodiversity of the Atlantic Forest

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## Introduction

The Brazilian Atlantic Forest is considered one of the three nature conservation hotspots on the planet (Mittermeier et al. 1999). This affirmation, oft repeated and reproduced in articles and publications, may seem to bathe the region in a positive glow. However, contrary to what many might think, this title does not in itself confer any honour upon the biome. A look at the criteria used in classifying a region a biodiversity conservation hotspot reveals that the term refers to a biome that has lost more than 70% of its original cover, but still finds itself severely threatened, a biome that, despite housing an extraordinary biodiversity, is nonetheless a region where efforts to revert the processes of loss of vegetal cover, genetic erosion (loss of biodiversity) and the obstruction of the environmental services essential to human survival and quality of life ought to be intensified and involve all sectors of the society.

The reasons behind the destruction of 93% of the original Atlantic Forest cover are just as well known as the consequences. More than five centuries of intensive and disordered occupation instigating three cycles of economic exploitation (brazilwood, sugar cane and coffee), the expansion of the Brazilian industrial park, particularly in the southeast, and the intense process of urbanisation and expansion in cattle raising over the last 50 years, have confined the remaining

forest and its biodiversity to an area equivalent to 9.3 million hectares (or 7.2% of the original forest cover). As a result of this devastation, the Atlantic Forest contains the highest number of endangered species on the list compiled by the Ministry of the Environment (2005), a fact made even more worrying when we consider that most of these species are endemic, which means they do not occur in any other natural habitat on earth.

Another cause for alarm is the realization that the remaining areas are extremely fragmented, with the largest single fragments measuring less than 100 hectares. In the gaps between these veritable relics of the original biodiversity of the Atlantic Forest resides more than 70% of the Brazilian population (some 120 million people), responsible for 80% of the nation's Gross Domestic Product (GDP).

Of an original area of 1.3 million square kilometres, less than 1% is currently protected by public strict use conservation units or Private Natural Heritage Reserves. However, if the figures representing the destruction of this remaining forest are impressive, so too are its levels of biological diversity. The total of mammals, amphibians, reptiles and birds in the Atlantic Forest reaches 1,361 species, 42% of which are endemic (Mittermeier et al. 1999). The Atlantic Forest, with its 20 thousand species of plant – 8 thousand endemic –, is the second largest tropical forest block in the country. In terms of diversity of arboreal species per area, the Atlantic Forest holds a world record for the 458 species found in one single hectare in the Serra Grande region, near Itacaré in southern Bahia (Thomas et al. 1998).

The challenge of protecting the remaining biodiversity and of restoring ecological connectivity to the forest fragments in certain priority areas – such as the Serra do Mar and Central Atlantic Forest Biodiversity Corridors – are enormous and entail difficulties proportional to the size and importance of the region. It is estimated that more than 80% of the remaining forest is located on private properties. It is therefore evidently necessary and fundamental that the entities engaged in the struggle to preserve the Atlantic Forest develop, adapt, test and prioritise strategies that promote the involvement of the private sector, whether in the form of large companies or small rural



producers, in efforts to protect and recover the biome's native forest cover. Such actions are essential if we are to guarantee the development of the region upon sustainable bases, as they promote the protection and recovery of the natural resources, such as water, soils and the biodiversity itself, that are fundamental to sustainable development and to improving quality of life for the human populations.

The Convention on Biological Diversity, of which Brazil is a signatory, identifies the creation of protected areas on private lands as one of the priority strategies for reverting the process of environmental degradation and loss of biodiversity. Projects that envisage planning for large-scale environmental protection, such as ecological corridors, point towards conservation strategies on private lands as one of the essential tools for reconnecting forest fragments. According to Article 8 of the Convention on Biological Diversity, the contracting parties should, as far as possible, establish a system of protected areas, or areas where special measures need to be taken to conserve biological diversity, in-situ (Glowka et al. 1996).

This article aims to provide the reader with a summary of the strategy adopted by the Instituto BioAtlântica – IBio (BioAtlantic Institute), in partnership with the forestry sector, to promote the in-situ conservation of biodiversity and forest restoration on private lands. IBio is an environmental organization founded in 2002 with the mission of integrating the visions, values and actions of conservationists and private companies. The IBio strategy involves partnerships and cooperation with various environmental organizations, rural communities, governmental institutions, researchers and companies from the forestry and energy sectors, among other groups.

## Protected areas on private lands

Conservation initiatives on private lands ought to be important components of national strategies for the protection of biodiversity and the sustainable use of natural resources (Environmental Law Institute, 2003). Developing countries, which already have difficulties

financing basic social services, like health and education, are gradually beginning to share the responsibility for “less immediate” policies, among which we can count the in-situ conservation of biodiversity (Beltrán & Esser 1999; Mesquita 1999; Morsello 2001).

Private initiatives can collaborate in a decisive manner towards these public policies, whether by protecting critical areas with high biodiversity levels, consolidating public/private partnerships for the large-scale conservation of threatened ecosystems – by protecting buffer zones around strict use conservation units or by forming ecological corridors – or by promoting the sustainable use of natural resources, especially water and soil (Environmental Law Institute, 2003).

Growing interest on behalf of the private sector in participating in the creation and management of conservation units could become a powerful tool, complementing public efforts for the establishment of protected areas. World Conservation Congress Resolution 1,65/1997 encourages governments “to give priority to complementing public systems of protected areas by developing programs that support conservation on private lands”. Reserves whose property and management are the responsibility of individuals, families, companies and environmental or scientific organizations can make a decisive contribution to bolstering public systems of protected areas, lending them some leeway in relation to their management objectives and further agility in managing protected spaces (Lees 1995). Even the best-run government-owned system of conservation units cannot possibly meet the current needs for the creation of protected areas, as public resources will always be limited and insufficient to meet this goal (Câmara, 1992). However, we need to have programs that grant some incentive for rural landowners, whether cattle ranchers or forestry companies, to provide effective protection for the natural resources on their lands, towards which they ought to feel a sense of responsibility.

In this respect, Brazil has some of the most advanced legislation in the world, including a law that establishes the category “Private Natural Heritage Reserve – PNHR” within the National System of Protected Areas. Under this law, although the landowner voluntarily

establishes the Private Natural Heritage Reserve, the land in question is given irrevocable and perpetual status as a conservation unit. Up to July 2005, there were already 664 PNHRs recognised by Ibama or by some State organ, together protecting more than 525 thousand hectares nationwide (data updated from Mesquita & Vieira, 2004). This amounts to one third of the total of private reserves in Latin America and a quarter of the total area protected on private lands. These figures become all the more impressive when we consider that there are hardly any incentives to promote the creation of such conservation units or to support their management.

However, creating conservation units should not be considered the only strategy for conserving remaining biodiversity on private lands, though it would appear to be the most successful and efficient. Countries like Costa Rica and the United States, for example, have expanded the protection of natural spaces on private lands through programs and incentives – financial, economic or social – that allow biodiversity to be maintained in a good state of conservation, while also encouraging initiatives for forest restoration. The National Fund for Financing Forestry (Fonafifo) in Costa Rica is a model that stands out in this sense, as it encourages small landowners to conserve and reforest their properties in return for payment for the environmental services rendered.

In Brazil, initiatives in place in the Northeast, particularly in regions with intense sugar/alcohol production, have demonstrated the potential of private sector action in protecting biodiversity. In the states of Alagoas, Pernambuco, Paraíba and Rio Grande do Norte, work is underway to establish a network of protected areas, some with PNHR status, created and managed by sugar and alcohol producers united under the *Instituto de Preservação da Mata Atlântica* (Atlantic Forest Preservation Institute), the organization responsible for drafting and implementing the strategy, which envisages the long-term protection of the last remaining tracts of Atlantic Forest in the north of Bahia.

The Atlantic Forest Central Corridor, which covers 8.5 million hectares, stretches from the state of Espírito Santo up to the Jiquiriça

River in the Valença region of Bahia. This is a large-scale sustainable landscape planning strategy that involves the formation of a mosaic of productive land and protected areas. The concept behind the strategy is that ecological connectivity among natural areas does not necessarily depend on physical connectivity so long as there are landscapes that permit gene flow between the fragments, thus reducing the formation of biologically isolated "islands of vegetation". According to Fonseca et al. (1997), a "biodiversity corridor" or "ecological corridor" is a system of parks, reserves and other areas of less intensive use that is placed under integrated management in order to guarantee the survival of the highest possible number of species in any given region. In this manner, the same authors conclude: "the design proposed for the Atlantic Forest Central Corridor makes the rigid, watertight and permanent categories for regulating landscape use more flexible and thus better suited to the ecological dynamic", also permitting the fine tuning of the system as new information becomes available.

In addition to this, large areas with well-preserved swathes of Atlantic Forest constitute important refuges for biodiversity, housing innumerable endangered species of flora and fauna. These same areas are also home to the water sources that replenish the region's towns and some of the industry installed therein. Good examples are Veracruz Station, which belongs to Veracel and, at 6,069 hectares, is the largest PNHR of Atlantic Forest, and Esperança Farm (2,900 hectares), which belongs to Aracruz and is currently in the process of acquiring PNHR status.

The implementation of a large-scale conservation program on private lands, integrating the largest landowners in the Central Corridor, presents a unique opportunity for complementary action and cooperation between the private and public sectors. The very design and logical hallmark of the Atlantic Forest Central Corridor places the effectiveness of its implantation at the mercy not only of decisions, actions and policies in the political and public spheres, but also of the commitment and performance of various segments of the private sector.

## Why establish partnerships with forestry companies

The Brazilian forestry sector is represented by the group of product and service segments engaged in silviculture and vegetal extraction and the activities of those companies processing or distributing products whose production involves the use of forest resources. According to a survey recently carried out by the Ministry of Science and Technology, the Brazilian forestry sector currently numbers 60 thousand companies generating a total annual turnover of US\$ 21 billion, which amounts to 5% of national GDP. The sector also accounts for approximately 10% of Brazilian export earnings. According to data released by the sector, in 2004 the total area of planted forest in Brazil was 5.5 million hectares, on which directly or indirectly depended 2.5 million jobs. The sector paid US\$ 3.8 billion in taxes and exported the equivalent of US\$ 5.8 billion.

If we consider the sum of all natural areas - understood as those not used for homogeneous plantations, whether for technical or legal reasons - we see that the forestry sector in Brazil controls some 1.6 million hectares of land destined for the conservation of biodiversity, the protection of water sources or for forest restoration. The Federal Government's Forest-Employment Program plans to increase the current total of 5.5 million hectares of planted forests to 11 million hectares, generating an expected 2 million direct or indirect jobs and making available a further 2 million hectares for new conservation areas, thus raising the total of land-surface set aside for the implementation of biodiversity conservation strategies to 3.6 million hectares (Aracruz 2005).

However, in the case of the Atlantic Forest at least, we also see that many tracts of these 4 million hectares of natural territory will not be able to fulfil their role as protected areas effectively unless initiatives are taken to invest in the formation of alliances and partnerships working towards this end. After all, many of these areas are linear fragments, often restricted to isolated strips of land established for permanent preservation under the Forest Code, some



of which retain none of their original vegetation due to previous usage. In addition, some of the well-conserved remaining forest tracts located on land owned by companies from the sector are likewise isolated, either boxed-in by the company's own planted forests or corralled by areas designated to other uses less favourable to the ecological permeability of the landscape.

For these reasons, *Instituto BioAtlântica* chose the planted forests segment of the forestry sector as its priority partner on its Program for the Conservation of Biodiversity on Private Lands, though without neglecting the rural agricultural producers, who have shown increasing receptivity to conservationist proposals and initiatives on their lands. Working in partnership with forestry companies can optimise the use of resources and generate large-scale results, as, apart from being a consolidated sector, it also possesses what no other sector can offer: large areas of land in priority regions for conservation.

In the Central Corridor alone, more than 200 thousand hectares belong to three large companies from the forestry sector (Veracel, Suzano and Aracruz). This includes areas designated as Legal Reserves and Permanent Preservation Areas, as well as other tracts that lack the ideal conditions for the plantation of homogeneous productive forests. The very topography and relief of the region, characterised by so-called "coastal boards", with plateaux interwoven with valleys, lend themselves to the creation of biodiversity corridors, as the valley floors and slopes are ideal for planning and management as protected areas or for forest restoration and the creation of ecological corridors. Besides this, the forestry companies active in the region have enormous potential to launch incentives to protect these remaining fragments, which together amount to more than 1,000 hectares of forest.

Working in partnership with forestry companies presents other advantages as well. As their business depends almost entirely on natural resources, the technical staff at these companies includes countless well-qualified professionals in the areas of forestry engineering, biology, ecology, soil management, environmental management and other disciplines related to the conservation of biodiversity. The paper and cellulose sector is considered one of the biggest investors in



technological R&D in the country, which is fundamental, for example, to the search for appropriate techniques for the efficient restoration of forest ecosystems and for monitoring environmental interventions. As such, these companies could also develop and adapt technologies for the restoration of woodland containing native species, thus accelerating the process of forming corridors between isolated fragments. As these companies prioritise the external market and are involved in processes to certify their forest management and products, they have the interest and the investment capacity to cooperate in the daunting task of protecting what is left of the Atlantic Forest and restoring part of the lost forest cover.

The expansion of forest development programs, which aim to involve other rural landowners in silviculture, has widened the reach and influence of these companies in the regions in which they operate. If, on the one hand, this poses environmental risks arising from difficulties in control and inspection, it also serves to broaden the



An area restored 7 years ago situated on land belonging to a forestry company.

target public of conservationist actions, attaining scales that would be unthinkable without the sector's development contracts and structures. The more the companies' development and promotion programs incorporate acts of conservation – such as the designation of Legal Reserves, the restoration of Permanent Preservation Areas, the creation of private conservation units, etc. – the more important they become as vehicles for the diffusion of best production practices and conservation opportunities.

For *Instituto BioAtlântica*, these intrinsic characteristics of forestry companies are available assets that need to be optimised and catalysed to develop initiatives in biodiversity conservation and forest restoration, especially in the Atlantic Forest. As this is a sector whose operations are based on the planting of trees, albeit in homogeneous forests, it is much more productive dialoguing and establishing partnerships and joint actions in forest restoration (using native species) with these companies than it is with, say, large cattle ranchers or soy producers, for whom trees are all too often – and erroneously – considered obstacles to production. Furthermore, being such a well-organized sector, both in terms of individual companies and collectively (with articulated and well-structured associations and representation), makes it all the more capable of wielding influence in decision-making processes.

## Program for conservation on private lands

This line of action at the *Instituto BioAtlântica* seeks technological alternatives and incentives to entice the private sector to directly engage in nature conservation, forest reformation and the formation of biodiversity corridors. The strategy adopted centres on partnerships and alliances with companies, landowners, environmental organizations, government organs, benefactors, investors and other sectors of society in the planning, funding and implementation of projects that envisage the expansion of protected areas and the effective restoration of forests located on privately-owned land.

The implantation of experimental conservation and restoration units, the monitoring of reforestation with native species on private properties, the drafting of public policies supporting private conservation, the planning of large-scale restoration projects and the correlation between conservation actions on private lands and other environmental services are just some of the initiatives IBio proposes through this line of action.

In October 2003 we began the first project on this program, entitled “Conservation and Restoration on Private Lands in the Atlantic Forest Central Corridor”, which plans the implantation of experimental conservation and restoration units with a view to testing management alternatives for protected areas on private lands and different forest restoration methods. There was a great deal of partnership work right from the planning and decision-making phases straight through to the implantation and monitoring of the set of experimental units, thus optimising technical, financial and logistical resources.

This project is run in partnership with Conservation International, The Nature Conservancy, Aracruz Celulose and Veracel Celulose, and its main objective is, initially, to use areas of company forest and private rural properties as conservation and restoration “laboratories”, enlarging the land area under protection and re-establishing its ecological function. In the future, as part of the strategy drafted for this program, IBio also intends to reconnect forest fragments,



Technicians from forestry companies and conservation organizations select areas for biodiversity conservation and forest restoration.

expand protected areas, partly through the creation of PNHRs, and create biodiversity corridors both inside and outside the company-owned areas. As will be presented in further detail in the next section, one of the positive consequences of this Program has been the creation of 5 new PNHRs on land owned by one of our partner companies.

The four experimental conservation units the project is implanting together total 2,600 hectares and aim to yield new knowledge on the planning and management of protected areas on private lands by testing management criteria and indicators directed towards both strict use protection and sustainable use. At the four experimental restoration units, which add up to 240 hectares, IBio and its project partners are monitoring the biomass growth of the species planted, comparing different restoration models, generating information to subsidise future projects for the creation of ecological corridors and studying carbon stockpiling via the plantation of native species.

## Support for the creation of PNHRs

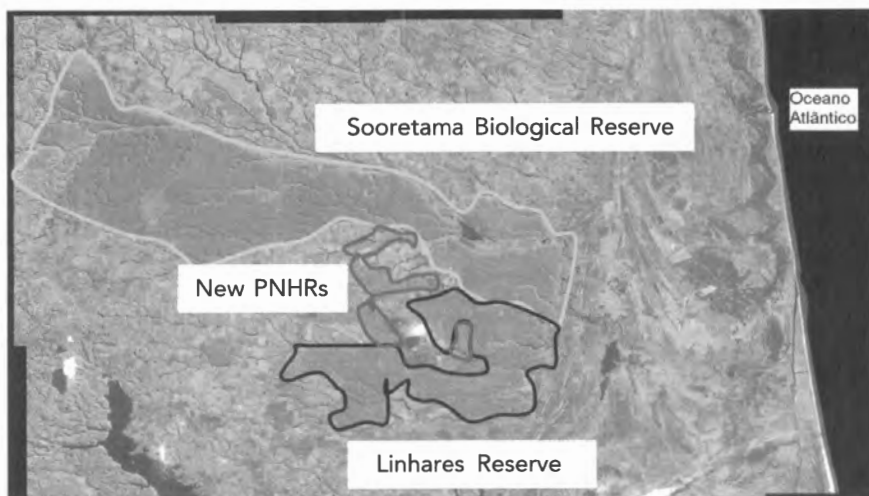
The studies and evaluations carried out by the Program for Conservation on Private Lands identified five areas of extreme value for nature conservation and for the management and expansion of ecological corridors on the property of Aracruz Celulose, one of the partners on the program Conservation and Restoration on Private Lands in the Atlantic Forest Central Corridor. The conciliation of IBio's interests with those of the company board resulted in the proposal and signing of a cooperation agreement to have these areas recognised as Private Natural Heritage Reserves.

By legalising the most significant forest tracts on its property – from the perspective of biodiversity conservation and the formation of corridors – as conservation units, the company is sending out a signal to society and to the market as to its commitment to preserving nature and wildlife. The areas singled out for the establishment of PNHRs are considered extremely important to conservation, as much for housing species listed as endangered, such as

the hook-billed hermit (*Glaucis dornnii*), as for being located in strategic areas for the formation of ecological corridors.

The three future PNHRs in Espírito Santo are located in one of the priority areas established by the Ecological Corridor Project. Two of these PNHRs will provide permanent protection to an important connection between the Sooretama Biological Reserve and the Reserve at Linhares, a private protected area owned by Companhia Vale do Rio Doce. Stretching over 2,900 hectares, the larger of the two new reserves in Bahia will become the second largest PNHR in this corridor.

There are currently 37 PNHRs in the Atlantic Forest Central Corridor, together protecting more than 11 thousand hectares. These new PNHRs represent a 48% increase in areas protected under this management category and 14% in the corridor overall. The impact will be greatest in the state of Espírito Santo, where the three new PNHRs to be created there will practically double the number of reserves and quadruple the area protected by units in this category.



Localization of the new PNHRs in the Atlantic Forest Central Corridor (the polygons are purely illustrative).



### *Dialogue between environmentalists and forestry companies*

In October 2003, thirty representatives from environmental organizations, producers of forest products, landowners and researchers met in Santa Cruz de Cabrália, in Bahia, to discuss themes related to the forestry sector and the conservation of biodiversity. This meeting was convened by The Forests Dialogue (TFD), a process for the promotion of dialogue among the various international parties interested in environmental themes associated with forestry activities. The meetings promoted by TFD have resulted in the formalization of commitments to implement and register actions and best practices that combine leadership, the establishment of conservation priorities, the management of information on biodiversity, social factors, financing and economic incentives in the pursuit of conservation results on a large-scale.

The success of the 2003 Dialogue on Forests and Biodiversity inspired three of the Brazilian organizations participating in the initiative – Instituto BioAtlântica, The Nature Conservancy-Brazil and Conservation International-Brazil – to propose the continuation of the dialogue, involving more regional agents and focusing on the development of a shared vision between forestry companies and environmentalists for the conservation of biodiversity in the Atlantic Forest. This proposal was received enthusiastically by the Managing Committee of the TFD and the three organizations are currently in talks with the leaders of companies and conservationist organizations to secure their support for the implementation of this effort and their help in spreading the concept in Brazil. The expectation is that the “Atlantic Forest Dialogue”, as the initiative is called, will bring tangible results in Atlantic Forest conservation and serve as a model for other TFD dialogues with a regional focus.

In addition to this initiative, *Instituto BioAtlântica* has been catalysing local dialogues and partnerships involving environmental organizations and forestry companies. The meetings underway in the Atlantic Forest Central Corridor between Aracruz Celulose and environmental organizations working at the World Natural Heritage Site in Descobrimento (far south of Bahia) are a good example.



These talks have given rise to a series of regional dialogues between organizations from the south and far south of Bahia and the three forestry companies operating in the region (Aracruz, Veracel and Suzano) on such themes as economic/ecological zoning, forest plantations around strict use conservation units and improved environmental practices for forestry development programs.

## Conclusion

The results obtained and lessons learned so far, especially in terms of restoration and conservation technologies for the Atlantic Forest and models for partnerships and cooperation between forestry companies and environmental organizations, have served to bolster the IBio Program for Conservation on Private Lands. Today, in conjunction with other local organizations, an integrated regional forest restoration program is underway throughout the entire region extending from the falls of the river Jequitinhonha (in Bahia) to those of the River Doce (in Espírito Santo).

The planned, proactive and integrated efforts of the public and private sectors and environmental organizations does not only mean more efficient performance, but also the optimisation of the available human, financial and technological resources. For companies interested in acquiring international forest management certification, being responsible for the protection of remaining forest fragments and for the restoration of one of the most important and most threatened ecosystems on the planet is certainly a differential. For the government, being able to rely on the support of society in its attempts to fulfil its constitutional duty to protect nature, represents important backing and a source of renewed will to complete its task. For the environmentalists, seeking agreements and partnerships with the private sector in order to obtain more concrete results in protecting Brazil's natural heritage is a challenge that is now truly being faced.

Support for the protection of ecosystems and the maintenance of viable populations of species in their natural habitats, as well as

the sustainable and environmentally sound development of buffer zones surrounding or adjacent to protected areas, are amongst the various measures that signatories to the Convention on Biological Diversity have a duty to implement. With the Program for the Conservation of Biodiversity on Private Lands, the *Instituto BioAtlântica* and its partners are making a decisive and large-scale contribution to fulfilling these goals.

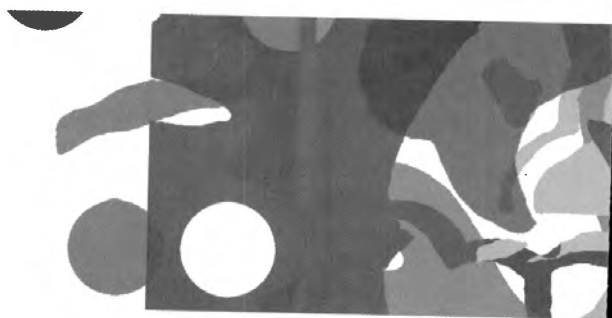
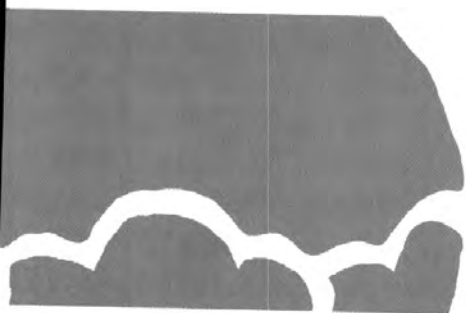
## Acknowledgements

The IBio Program for the Conservation of Biodiversity on Private Lands is made possible by the direct cooperation of various institutions, amongst which we would like to make special mention of The Nature Conservancy, Conservation International, *Associação Flora Brasil* (Brazil Flora Association), *Instituto Cidade* (City Institute), *Grupo Ambientalista Natureza Bela* (Beautiful Nature Environmentalist Group) and *Associação dos Nativos de Caraíva* (Caraíva Natives' Association), as well as the companies Aracruz Celulose and Veracel Celulose. The projects that comprise this program depend on financial resources donated by the United States Agency for International Development (Usaid) through the Alfa Consortium, the Critical Ecosystems Partnership Fund (CEPF) and the Conservation International Centre for Biodiversity Conservation (CBC), and our partner companies. To all of our partners and benefactors and especially to the rural landowners who have sensitised to and engaged with our actions, we would like to extend our sincerest thanks.

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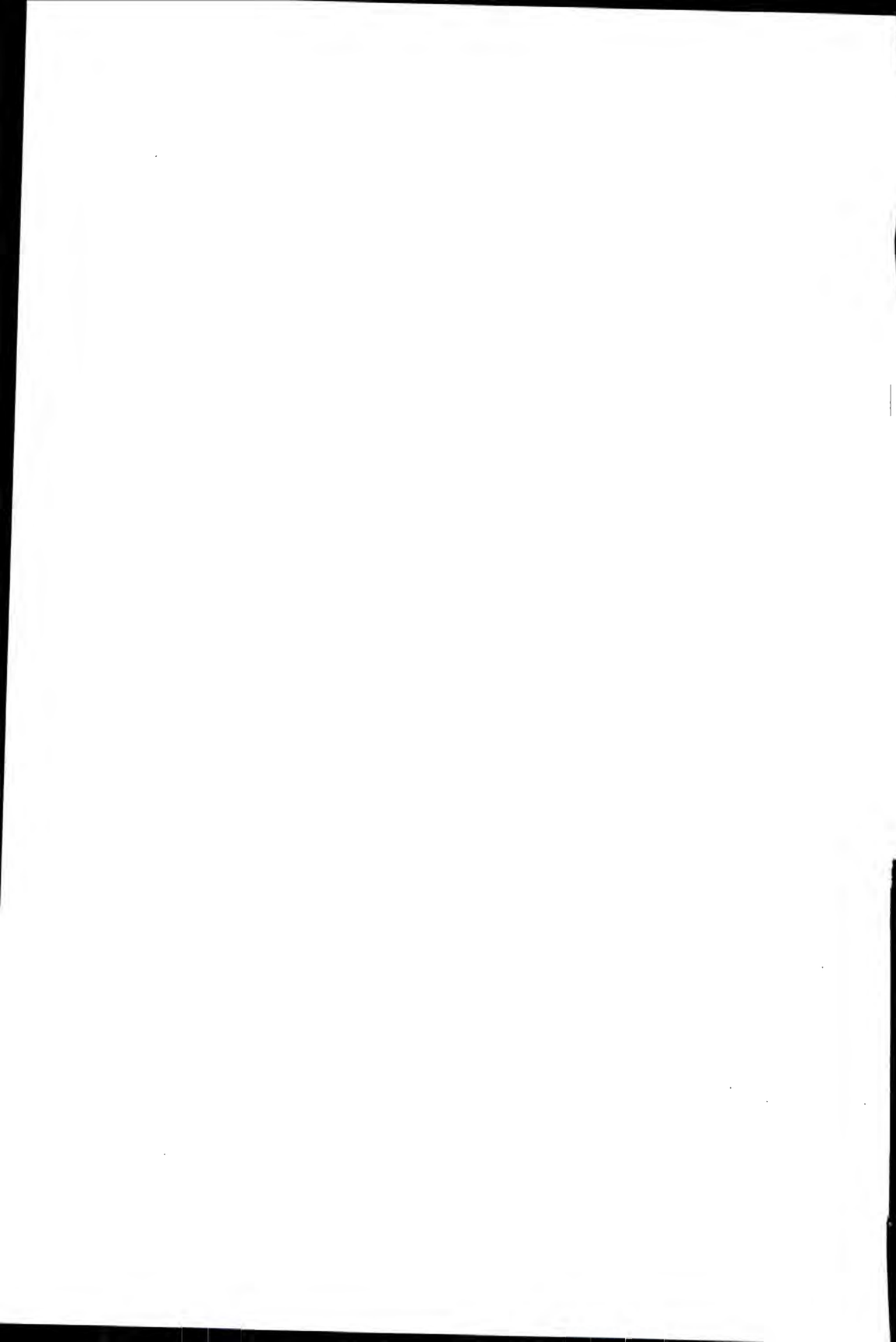
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Give me a helping push  
and I'll move the world







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# Civil society and the Amazon Region Protected Areas Program (Arpa)

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Cláudio C. Maretti

'Amazon' is probably one of the best-known names in the world. In the past, it was sometimes associated with estrangement, a 'green hell' from the perspective of the 'Old World', particularly of the 18th and 19th-Century European 'explorers'. On other occasions it was (and sometimes still is) equated with Eldorado, that is, seen from the perspective of the considerable riches it could contain, normally imagined in the form of mineral resources, but nonetheless a source of potential enrichment mostly for the elites of countries with Amazonian territories, triggering a 'rush to the West' (or North, South or East)... In recent decades the Amazon has come to once more occupy space in the 'Western', national (in terms of Amazonian nations) and even local imagination through such notions as the 'the world's lungs' and the 'global barn' of biological diversity.

None of these perspectives was borne out completely in all its direct and immediate expectations. However, nothing could be truer than to say that there are natural resources with important potential for exploitation in Amazonian territory. It is also true that, regardless of whether the region is or is not the world's most important producer of atmospheric oxygen, there can be no doubt that the deforestation of considerable swathes of the Amazon seriously compromises the global climate balance. It is also true that, while there are specific locations in other parts of the world with greater biological biodiversity, especially as defined by the Convention on Biological Diversity,

encompassing the levels of ecosystems, species and genetic variability, there is no place on earth to rival the Amazon in terms of ecological riches when we consider its size, relatively low level of alteration and potential for knowledge. And that is to say nothing of the water resources contained in the world's most important catchment basin.

Based upon these and other considerations, there is, whether rightly or wrongly, a view that certain foreign or international bodies harbour 'imperialist' intentions towards Amazonian territory and its riches and this often lends a geo-strategic character of territorial domination to the occupation of the Amazon.

These and other potentialities or concerns have been responsible for often 'careless' forms of occupation or use of Amazonian land:

- As occurred with the opening of roads and the stimulation of occupation (Brazil from the 1960s to 1980s);
- As occurred for some time with the extraction, legal or otherwise, of mineral resources (Brazil, Suriname, etc.); and
- As has also occurred with the completed and/or planned integration of South America through highways, electrical power lines, waterways, etc. (Venezuela, Guiana, Brazil, Peru, etc);
- As occurs with the current trends in oil prospecting in various countries (Peru, Ecuador, Bolivia, Brazil, etc.); or
- As still occurs through lumbering, deforestation to make way for cattle pasture or the plantation of grains and other crops (especially in Brazil);
- Not to mention the appropriation of vast tracts of land as ballast for a predatory, antiquated and anti-social capitalism and the speculation and theft of land (often under the well-known form of "*grilagem*", the issuing of false deeds of ownership) practiced by the 'rotten apples' of the private sector (once again, especially common in Brazil in recent decades and, no doubt, also in the near future).

Running counter to this, however, is the need for more adequate models of occupation, use and development that could take the

necessary care to maintain the most part of the existing ecosystems and, above all, preserve the environmental services that are so very important not only globally, but locally. Curiously, some of the myths return with a greater ring of truth the more thoroughly it is demonstrated that the devastation of forest and other ecosystems in the Amazon affects first and foremost the Amazon's own climate and secondly that of the rest of its neighbouring nations in South America. There is also mounting evidence to support the fact that not only do models of occupation imported from other environments show little potential for flourishing in the Amazon, but its degradation results in losses for these and other economic activities, not to mention the negative impact on its social groups – including at a cultural level.

Even if they do not fulfil their full potential if taken in isolation, the best way to protect nature is through protected areas in general and nature conservation units in particular. Of course it is true that only by working from a broader perspective, integrating conservation units in the regions in which they are based, associating them with more careful and adequate forms of occupation and use in the rest of the territory and forming systems of protected areas, can we attain more consistent and completely valid results. However, this serves only to underline the importance of protected areas in all their various categories and complementary functions as the foremost instrument in the conservation of nature and associated social (economic, cultural, etc) values.

Now, the importance of the region, awareness of the errors inherent in the models of use and occupation and the demand for more adequate solutions have been fuelled above all by the understanding of society and the expression of that understanding through civil<sup>41</sup>

41. There are perhaps other ways of understanding 'civil society', for example, as the counterweight to the military side of society, but in this text we have adopted the concept of civil society as that which differentiates itself from the government or from the 'political society' in broader terms, hereby understood in the relatively restrict sense of political parties and other mechanisms directly related to spheres of government or to the direct dispute for governmental power. In other words, civil society does not preclude a political role, it simply keeps it separate from the instruments used in the search for – or the exercise of – governmental power. As such, the concept of civil society bears some relation to NGOs, but these are but one form, and a bureaucratic

(sometimes also called 'organized') society. These expressions, which result from a range of movements by various different social groups, represent the demand for a solution while clearly soliciting and accepting protected areas as one of its most important mechanisms. Naturally, this does not come without differences, controversy, divergences and even contradictions, but it is nonetheless a result in favour of the creation of conservation units, at least in terms of support for parks and extractive reserves (which can be national, state or municipal), as other categories do not yet enjoy similar social backing.

Besides the social 'clamour', the direct participation of some non-governmental organizations (NGOs)<sup>42</sup> has been fundamental to the resulting actions now underway in the Amazon.

On the one hand there are expressions that come from base associations or social movements, as is the case with the rubber tappers, whose main organizational body is the *Conselho Nacional dos Seringueiros* (CNS – National Council of Rubber Tappers), – among other, more local expressions, such as the *Organização dos Seringueiros de Rondônia* (OSR – Rondônia Rubber Tappers' Organization) –, which from the very beginning, as a consequence of the struggle

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form, of its expression. Thus, in this text we have omitted the 'organized' aspect that usually accompanies the term 'civil society', as we understand that social groups also have non-organized and non-bureaucratic forms of political expression that are every bit as valid, legitimate and even sometimes as effective as their 'organized' counterparts. Obviously, civil society also differentiates itself from organizations created for directly economic ends – production, profit and the generation of wealth, and this includes companies and cooperatives, among other institutions. (This is not to say that manifestations of civil society do not express economic or political interests, it is just that these are never directly linked to economic production or to the exercise of governmental power.)

For more details, see:

Acosta, Yamandú. 2003. *Las nuevas referencias del pensamiento crítico en América Latina: ética y ampliación de la sociedad civil*. Montevideo, Universidad de la República, Facultad de Humanidades y Ciencias de la Educación. 304 p.

42. In this text, by 'non-governmental organization (NGO)' we mean not only specialized groups, but also other more or less professionalized groups that are open in some degree to the participation and influence of the people, officially registered (with names derived or not from associations, institutes, foundations, etc.) and with no links whatsoever to any sphere of government. Otherwise put, they are organizations that may form associations with government, receive or donate resources to or from government, exercise influence over and negotiate with government, etc., but are not formally linked to government decisions.

made famous by the Chico Mendes<sup>43</sup> saga, has defended the creation and implementation of extractive reserves. This struggle initially arose out of labour disputes and the fight for survival, though it later associated itself with the environmental cause in search of greater support and repercussion on an international scale, a synthesis that gave rise to the concept of the extractive reserve – which could be understood as hybrid were it not for the more interesting possibility that this focus might respond to a reality that, beyond being integrated, is unique and artificially reflected in this separation between the social demand and the conservation of nature. In its original concept, post-synthesis, the intention was that the extractive reserve would represent a partnership between government(s) and local communities in which the former would secure the land and turn it over to the communities, which, in turn, would maintain the processes for its social reproduction, while making careful use of the natural resources through a sustainable extractivism that collaborated in the conservation of the forest and other ecosystems and even in the ongoing surveillance of the area.

On the other hand, expressions arising from specialized groups, environmental NGOs or conservationists defend a more effective protection of the Amazon. Following globally accepted technical recommendations, the protection of a representative Amazonian sample comprising no less than 10% of the entire area of its ecosystems was considered fundamental. Various conservationists defended this thesis, which was deemed correct at the time, basking, for example, in the support of the technical conclusions reached by the 4<sup>th</sup> World Conference on National Parks and Other Protected Areas (Caracas,

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43. In the light of the definitions presented above, it is clear that social movements (when their objectives are not directly connected with governance) are an integral part of civil society. The case of the rubber tappers shows how they began their movement as civil society, defending their own interests, before going on to make use of labour organizations (rural workers' unions) and only later turning to such associations as environmental NGOs to further their cause. Throughout this process they came to establish their own organizations, such as the *Conselho Nacional dos Seringueiros* (CNS), set up with clear labour union connections, but soon branching out into the expression of wider political interests. Today, it is in every way an embodiment of the concept of an NGO.

Venezuela, 1992). The controversy, once again predominant at the heart of civil society, was, above all, about what to do with the remaining 90% and, secondarily, what sort of conservation units to consider for the protected 10%. Drawing upon its forest defence alliance with the World Bank, the WWF (the largest global network of conservation NGOs<sup>44</sup>) managed to convince the Brazilian government to commit to defending a minimum of 10%.

Considering that most of the Amazon should be under some form of protection and that other governmental programs, including those for Amazon defence – such as the Pilot Program for the Protection of Brazilian Tropical Forests (known as ‘PPG7’) –, already offered more support to sustainable economic activities than to protection in a strict sense, and seeking to defend an ecologically representative sample of the biological diversity of the Brazilian Amazon, the Brazilian government and its partners, in dialogue with civil society (social movements and NGOs), outlined what were to become the goals of the nascent Amazon Region Protected Areas Program (Arpa):

- The creation of 285 thousand square kilometres of new strict-use protected areas<sup>45</sup>;
- The creation of 90 thousand square kilometres of new sustainable development areas<sup>46</sup>;
- The consolidation of more than 125 square kilometres of existing strict-use protected areas (in addition to those to be created);

44. Not considering the union of various organizations, as with the largest, IUCN – World Conservation Fund, or other, smaller unions, which do not function as networks properly speaking.

45. Conservation units belonging to the strict-use group, as defined by the ‘Snuc (National System of Conservation Units) Law’, include biological reserves, ecological stations and parks on any of the three levels, though concentrated on the federal and state levels – equivalent to categories I and II of the IUCN international classification.

IUCN. 1994. Guidelines for protected area management categories/by IUCN-CNPPA [now IUCN-WCPA] with the participation of the WCMC [now Unep-WCMC]/. Gland, IUCN. x + 261 p. Brazil. 2000. Law nº 9.985, of July 18, 2000. Brasília.

46. Conservation units belonging to the sustainable development group, as defined by the ‘Snuc (National System of Conservation Units) Law’, include extractive reserves and reserves for the sustainable use of natural resources on any of the three levels, though concentrated on the federal and state levels – equivalent to category IV of the IUCN international classification.



- The establishment of a Protected Areas Fund for the long-term maintenance of the conservation units supported by the program; and
- The establishment of a conservation continuation system, among other mechanisms for the implementation of conservation.

However, civil society and NGOs play an important role in the management of this program. At the head of the chain of command of the Arpa Program, the Brazilian government, through the Ministry of the Environment, in whose name the program is executed, determined that the Program Committee be participative and peer-based, with half of the members coming from civil society, two of whom are representatives from conservationist NGOs and two from socio-environmental NGOs, all active in the Amazon region, plus representatives from the Brazilian Biodiversity Fund (Funbio) and WWF-Brazil, the latter representing private donors. As determined by the Ministry, all donated resources are forwarded to the program through Funbio, which manages the financial resources, taking care of all service hire, acquisitions and purchases, which are then delivered to the conservation units of the institutions participating in the project (currently Ibama and the environmental organs of the states of Acre, Amapá, Amazonas, Mato Grosso, Pará, Rondônia and Tocantins). Funbio is also responsible for managing the Protected Areas Fund, also part of Arpa, for the long-term maintenance of the areas supported by the program<sup>47</sup>.

However, in relation to the Arpa Program, perhaps most important of all are the fundamental roles civil society can play in guaranteeing the long-term sustainability of Arpa's results. On one extreme,

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47. The Brazilian Biodiversity Fund (Funbio) is a non-governmental organization created by the National Biodiversity Program (Pronabio) in partnership with the Global Environment Facility – GEF for the implementation of the Convention on Biological Diversity in the private sector (or non-governmental sector) in the broad sense. Its activities, which complement the implementation of the Biodiversity Program (Probio) in the public sector, work towards sustainable use among local communities and the protection of the environment through private reserves or company initiatives, among other measures.

Funbio was the institution the benefactors and the Brazilian government chose to manage the resources donated to the Arpa Program.

it is well known that protected areas cannot succeed without the support of the local communities around or within them. It is worth acknowledging that the creation of protected areas (or simply the creation of what are wrongly and mockingly called 'paper parks') can indeed be effective ways of reaching some goals, such as the reduction of deforestation, but only in the short term and only in particular contexts. At the other extreme, it is worth remembering that the Arpa Program intends to at least triple the quantity of protected areas in the Amazon (considering the categories supported). This means that, while Ibama has a structure that is reasonably capable of managing the Conservation Units in place today, it will clearly be insufficient to handle such expansion, even in the simple terms of human resources; and the situation at the state environmental organs is bleaker still. As such, it is absolutely necessary to be able to count on a significant number of non-governmental conservationist organizations with the credentials to be able to assume the shared management of Amazonian conservation units.

In other words, rather than sit and wait for the providing state, it is up to civil society to propose, demand, criticise and lay claim, just as it is also incumbent on NGOs to propose, collaborate, search for solutions and serve as a channel through which society can fulfil its responsibilities. This is not to ignore the responsibility of the government, companies and other sectors, groups or social agents, but civil society must also do its part for a better society.

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# Climate change and the conservation of biological diversity

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Clovis Borges

The Atlantic Forest is recognised as one of the top five priority areas on the planet in terms of the conservation of biodiversity, a reflex of the environmental variability along the Brazilian coast brought about by differences in climate, geology, soil and sea influence. On the other hand, with only 7% of its original forest cover remaining, it is also considered one of the most severely threatened. The tracts along the coast of the state of Paraná are the most representative of the original forest and the least fragmented in the biome, which comprises a mosaic of environments ranging from shoreline stretches to mountain coverage at heights of 1,000 metres.

Through a partnership between the Society for Wildlife Research and Environmental Education (SPVS) and The Nature Conservancy (TNC), three projects are underway in this region with the aim of mitigating the greenhouse effect through carbon stockpiling in the vegetal biomass and conserving the area's biodiversity in-situ. These projects are: the Atlantic Forest Restoration Project; Action Against Global Warming; and Reforestation in Antonina, funded respectively by General Motors, American Electric Power and ChevronTexaco.

The implementation of these projects involved the acquisition and management of some 19,000 hectares in a particularly strategic region for the conservation of biodiversity in the Atlantic Forest. The areas selected were so chosen for possessing both areas degraded by buffalo

ranching and important remaining forest tracts suitable for the conservation of biological diversity. In order to ensure the perpetual conservation of these areas, processes are underway to have them turned into Private Natural Heritage Reserves – PNHRs (the official designation for conservation units in Brazil).

In order to reach the conservation targets, these areas are managed in accordance with the technical criteria of a plan that was drafted on the back of a series of socioenvironmental diagnostics. Before activities could get underway, the necessary infrastructure had to be implanted, including an administrative base, accommodation for staff, researchers and visitors, a radio communication system, equipment in general and vehicles, among other things. A network of some five hundred kilometres of fully mapped and signposted forest trails was also established for purposes of inspection, environmental education, research and management.

One of the most important tools used is the Geographic Information System – GIS. Based on data from remote sensors, such as ortophotos and satellite images, it was possible to develop a cartographic base (including geological maps) on environmental fragility, soils, vegetation and other factors, to support the management and research activities.

More than 1,000 species of plant have been surveyed, as well as a wealth of environments and their particularities. Prior diagnostics concerning fauna have helped identify species previously unknown to science and pinpoint vulnerable and endangered species (fifteen species of fish, five amphibians, two reptiles, eighteen birds and eighteen mammals). Early prospecting identified at least 68 archaeological sites, though there are possibly many others. Much remains to be discovered about the biological richness of this area, which warrants the 30 research projects currently underway in various thematic fields, many of which rely on little information about the biome, such as the project on the diversity of terrestrial fauna. These projects are conducted in partnership with various universities and research institutes, which also makes it possible to train students through internships, field trips and workshops.

As part of the drive to reach the project's targets for the capture of atmospheric carbon, a program has been established to restore 1,500 hectares of forest in degraded areas. This program will help restore and conserve some of the most degraded Atlantic Forest environments in the region, those located on the riverside plains and at the feet of the mountains. The restoration techniques use knowledge of the environmental characteristics of the area to be worked on in order to define the species to be planted and the planting techniques to be used. The bases of the project are the natural succession processes of each environment. The project also envisages the development of a restoration model that could be replicated and/or adapted for use in other degraded areas in environments similar to the Atlantic Forest.

Another aspect of the project is interaction with the surrounding communities through the implementation of demonstrative models that promote strategies for development that are compatible with environmental conservation. This interaction takes as its base the communities' capacity for human development, ability to form associations and to develop alternative sources of income. At the outset, the activities adapt to the traditional pursuits already practiced in these communities, such as the development of agro-forestry systems generally involving banana and palmheart (*Euterpe edulis*) and the keeping of native bees, though with focus on technical training for production and on the transformation and certification of the product, thus aggregating value in terms of sale price. These products result in environmental improvements for the region by reducing the use of pesticides through the adoption of biological control, lowering the incidence of slash-and-burn practices and the clearing of new areas, the recuperation of permanent preservation areas and selective garbage collection, among other contributions.

An Environmental Education Centre was constructed as a base for the projects and as a venue for environmental education activities, training and events for the surrounding communities and visitors from other regions. An environmental education program is also underway, bringing agroecology concepts and experiences to the region's

schools in order to help students develop an awareness of the nature around them and of the alternative and viable sources of income that are open to their communities.

The projects are also a source of employment for the longstanding residents of the region and thus help aggregate social value. To carry the activities out, a training program was set up through which employees received various courses on reservation management. An adult literacy program is also in place inside the reserves, providing up to eight-grade schooling for these employees. In addition, such themes as environmental education, group work, communication and alternative sources of income are also continuously worked upon. The program also benefits the families of its employees through social assistance initiatives.

Another important aspect is that once these employees have assimilated the concepts and practices of the projects, they become multipliers of the work proposal within their communities and in neighbouring areas. Three years into the project, we can see that the work done has resulted in significant improvement in environmental awareness, wider perspectives for professional growth for the population and a general improvement in living conditions.

In addition to lessening the greenhouse effect and conserving biodiversity, the projects have also been responsible for a series of additional benefits, such as the protection of the water sources that supply various communities and a city of 20,000 residents; the development of technologies compatible with the rational use of natural resources, such as effluent treatment stations; the protection of riverbanks and hillsides against erosion; and the implementation of selective garbage collection. In this fashion, such projects can generate significant and measurable economic and environmental benefits for developing countries like Brazil.

The implementation of policies to reduce the harmful results of the greenhouse effect agreed upon at the Convention on Climate Change has led to the development of projects that also contribute towards the goals established by the Convention on Biological Diversity, such as those of Article 11, which deals with incentives related



to the adoption of economically and socially responsible measures that encourage conservation and the sustainable use of components of biological diversity, as well as other targets. This project model allows for the inter-relation of certain goals from both conventions, thus optimising actions and the financial resources that make them possible.



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# Seeds of passion: germinating agrobiodiversity conservation policy in the bushlands

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Paula Almeida and Paulo Diniz<sup>48</sup>

## Reaping the fruits: a stroll through the seed fair

There were already 220 community seed banks in Paraíba and more than 200 rescued local seed variations<sup>49</sup> when 2,000 cultivators and farmers from the network *Articulação do Semi-árido Paraibano* (Articulation for the Bushlands of Paraíba) gathered in Soledade for the first *Festa Estadual da Semente da Paixão* (Seeds of Passion State Festival).

Taking a virtual stroll through the seed fair, an observer would be met with a different family, communitarian or regional experiment at each stall, not to mention, of course, the biodiversity of the bushlands. First up are José Felix and Feliciano and his daughter Nelsa, from the *Central de Assentamentos do Alto Sertão da Paraíba* (Centre for the Settlements of the Upper-Bushlands of Paraíba), presenting the countless landrace seeds they have rescued, such as the rare 'Padre Cícero' white corn seed, and proudly extending a decorative sieve with the name of their organization spelled out in seed mosaic. José

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48. Technical advisors in the areas of agronomy and sociology respectively at AS-PTA – *Assessoria e Serviços a Projetos em Agricultura Alternativa* (Consultancy and Services on Projects in Alternative Agriculture). Since 1993 AS-PTA has been working in partnership with farming organizations on a Sustainable Development Program for agroecology-based family-run farming in Paraíba.

49. In Brazil, the terms 'local varieties', 'Creole varieties' or 'native varieties' are used to define the inter-species variability among species developed by farmers and indigenous groups.



Farmers present their seeds at the 1<sup>st</sup> Seeds of Passion State Festival in Paraíba.

Pequeno and Expedito, residents of the São Tomé Farm in Alagoa Nova are also there, exhibiting diversified bean, corn and fava seeds in bottles and small silos and explaining to the passers-by how the São Tomé community seed bank, now in its thirtieth year, is the oldest in Paraíba. At another stall, Ms. Biluza is presenting her products made from native fruits. Her cashew line alone has juice, sweet, cashew honey, cashew wine and cashew peel, used as a curative for burns. After Ms. Biluza come Aldo and Tânia with their hay and silage made from native plants and their special goat and sheep feed. The observer can also see the seeds of various scrubland plants, such as peppertree, *juazeiro* and hog-plum, stored away and waiting to be multiplied and distributed among the neighbours. You will probably also note that each of the farmers and cultivators present at the fair is carrying a '*matulão*', a large cloth sack with handle straps, which they cram full of seeds and other agroecological products they have come across at the stalls and want to take back home with them.

At the other end of the fair the visitor can look round a small bushland farm set up as a living display, complete with its corral

of blue goats, and farmyard with its typical *'faxina'*<sup>50</sup> of medicinal plants and irrigation mandala<sup>51</sup>, the scene topped off with a gaggle of *carijó* chickens. Inside the house, just under the altar, the visitor can examine the jars of seeds stored away for next winter's sowing. Representing the community's seed bank there's a stall with a collection of silos and other natural products traditionally used by the farmers and cultivators to treat their seed stores.

The observer might also join the bushland farmers in their celebrations of the hard-won achievements of the drive to conserve this diversity. Each makes an offering of the seed of his or her passion at the altar mounted on the stage: Terezinha from Remígio, chanting the canticle she customarily sings while planting her seeds, has come to offer up ears of pointed corn, a variety her family selected over a century ago, while Antônio de Edísio leaves a bottle of *cariri* blackeyed peas (the type planted in the Curimatáu region of Paraíba), which his mother has specially corked with wood ash from the Saint John's Day bonfires.



The couple Aldo and Tânia, cultivators of Paraíba Cariri, show their experiences of living and working in the bushlands of Paraíba at the 1st Seeds of Passion State Festival.

50. A 'faxina' is a typical bushland horticultural and medicinal vegetable garden fenced in with sticks.

51. A mandala is a small irrigation system consisting of plastic pipe circuits whose collecting basin can also be used to raise fish and keep waterfowl.

You, reader, have just taken a tour through the 1<sup>st</sup> Seeds of Passion State Festival, a landmark for the Articulation for the Bushlands of Paraíba network. The Festival crowns more than a decade of struggle and achievement in the drive to strengthen agroecological family-based agriculture as a means of living with – and off – the bushlands, recovering and valuing the local biodiversity so eloquently symbolized by the seeds of passion.

The seeds of passion are the heritage of the bushland families, an inheritance handed down to them by their ancestors, and generations of farmers have worked on customizing them with each passing harvest through an on-going process involving individual and collective strategies for reproducing these seeds. Many varieties of plants are cultivated, such as corn, beans, blackeyed peas, fava beans, rice, peanut, cassava, and native plants, comprising a mosaic of diversity adapted to different environmental conditions within the region and to the rich alimentary culture of the bushland peoples. The term – Seeds of Passion – was coined by a cultivator from the Paraíba Bushlands, Mr. Dedé, referring to the partiality of each grower in the region to his or her own landrace seeds as opposed to those brought in from other parts and therefore not adapted to the bushlands. As he used to say: “...each grower has the seeds he likes and prefers to plant, they’re the seeds of his passion”.

We invite you to accompany the history of these farmers – the experience of the Paraíba Seed Network in its endeavour to develop a policy based on quality, diversified seeds especially customized to the local conditions and respecting and maintaining the local knowledge, innovations and practises of the communities.

## Sowing the seeds of life: the value of biodiversity

Bushland crop plantations are diversified, with many species and various types of seed. The native plants are sources of fruit, providing food supply for the animals, as well as firewood, timber and medicines.



The homesteads guarantee their subsistence and health with vegetables, fruit and poultry and by growing medicinal plants. There is even diversity in the animals raised, from the small – bees, chickens, guinea fowl and turkey – to the medium and large, like pigs, goats, sheep and cattle.

Such diversification has been a fundamental mechanism in the strategy of family-based agriculture to reduce the economic risks posed by the climatic instability of the bushlands, increase the general productivity of these small acreage properties and to ensure food security for the farming family.

Along with the seeds of passion, diversified and customized as they are, comes a body of associated learning, a system of knowledge developed and socialized from generation to generation. As such, for the bushland populations, the seeds of passion constitute an important genetic and cultural heritage<sup>52</sup>.

Despite its importance in terms of food security and survival in the bushlands, this heritage, so essential to the lives of these families, finds its sustainability constantly under threat, whether from the successive droughts and sparse access to land, or through government policies that promote the substitution of the seeds of passion with other varieties brought in from elsewhere and therefore neither customized to the region, nor compatible with the cultural context of the bushland populations<sup>53</sup>. Given their typical scarcity at harvest time and historically high purchase price in the bushlands, seeds have often been the preferred currency for vote-buying by unscrupulous politicians. In virtue of these and other factors, the region's

52. Cf.: PETERSEN, Paulo, SILVEIRA, Luciano M. e SABOURIN, Eric. *Agricultura familiar e agroecologia no semi-árido: avanços a partir do Agreste da Paraíba*. Rio de Janeiro: AS-PTA; 2002.  
53. The Northeast has always been seen as a dry region into which public resources had to be ploughed to "combat drought". Little store has ever been placed on the region's potential; quite the contrary, all of the development models tried have been brought in from elsewhere, consolidating its stigma as the "problem region" of the country. For more on this, see: ALBUQUERQUE JUNIOR, D. M. de. *A Invenção do Nordeste e outras artes*. Recife: FJN, Ed. Massangana; São Paulo: Ed. Cortez; 1999; NEVES, F. de C. *A multidão e a História: saques e outras ações de massas no Ceará*. Rio de Janeiro: Relume Dumará; Fortaleza/CE: Secretaria de Cultura e Desporto; 2000; and MOREIRA, Emília & TARGINO, Ivan. *Capítulos da Geografia Agrária da Paraíba*. João Pessoa: Editora UFPb, 1997.



João Miranda and Terezinha rescue and conserve seed varieties that are resistant to drought and especially adapted to the bushlands.

cultivators have had to face difficult access to seeds, which have in turn suffered an intense process of genetic erosion.

It is fundamentally in virtue of this problem that the Articulation for the Bushlands of Paraíba has spent the last ten years promoting the value of these local seeds, the seeds of passion, and mounting stockpiles through the establishment of Community Seed Banks<sup>54</sup>.

## The birth of a seed policy for Paraíba

The process of mobilization and struggle for local seeds started to gain force and political importance in 1999, a time when seeds were particularly scarce due to drought of the previous year, which had affected almost the entire bushland region and was one of the worst ever witnessed. It is directly after the dry spells that the

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54. Cf. DINIZ, P. C. & DUQUÊ, G. *Estimulando o debate sobre convivência com o semi-árido: os bancos de sementes comunitários no Agreste da Paraíba* (pp. 103-120). IN: DUQUÊ, G. (org). *Agricultura familiar, meio ambiente e desenvolvimento: ensaios e pesquisas em sociologia rural*. João Pessoa: editora universitária/UFPB; 2002.

cultivators find themselves in shortest supply of seeds and most in need of a concrete government intervention strategy capable of soothing the situation.

That year, 1999, the State government showed some concern over the consequences of the drought, as the planting and harvesting of grains throughout the state were jeopardised when seed stocks ran dry among rural producers. This led to the implementation of the “Paraíba State Government Program for the Timely and Subsidised Distribution of Price-Selected Seeds”. The Program was run by the State Secretary of Agriculture and its suppliers included Emepa – *Empresa Estadual de Pesquisa Agropecuária* and its offshoot distributor, Emater-PB.

Upon learning of the program, the Articulation for the Bushlands of Paraíba began to question the Paraíba State Government’s seed policy as to its ability to supply the farming families connected to the community seed banks. In fact, the program did not meet Articulation’s expectations, much less those of the farmers of Paraíba State, as it drew entirely upon a reduced genetic base and thus neither contributed to avoiding genetic erosion, nor to rescuing and conserving the local seed varieties. Furthermore, the administration and management of the program (donation and/or subsidised sale) and its political aspect (use for electoral purposes and cronyism) served only to accentuate its unsustainability.

After a series of negotiations with the State Government, we were finally granted a public session at the Legislative Assembly. The main source of political pressure exercised upon the government at this Session came from a germination analysis conducted by Articulation in partnership with the Seed Analysis Laboratory at CCA/UFPB<sup>55</sup>, which detected an extremely low germination rate in the corn distributed by the program.

As a result of this pressure, the Paraíba State Government established its first cooperation agreement with Articulation on April 15, 1999. This agreement channelled thirty-five tons of brown bean seed

55. Centro de Ciências Agrárias da Universidade Federal da Paraíba, Campus II - Areia/PB (Federal University of Paraíba Centre for Agrarian Sciences).

(*cultivar carioquinha*) and fifty tons of BR-106<sup>56</sup> corn seed into community seed banks. This volume was enough to support the strengthening and/or restructuring of 129 Community Seed Banks supplying 4 thousand families statewide.

Thus began a more systematic process demanding the development of a seed policy for the state that adopted community seed banks as a fundamental instrument.

Community seed banks began to emerge in Paraíba during the 1970s as an initiative of the Catholic Church. Despite the farmers' best efforts to produce and stock seeds on a family level, these were not enough to meet annual stock requirements or to conserve local varieties. The seed banks originated in precisely this context, as part of a local self-management system designed to provide greater security to the farming families. Upon joining the bank, the farmer is automatically entitled to a certain quantity of seeds, which, in accordance with rules established by member consensus, he or she must repay to the bank after harvest time in a larger quantity to that originally borrowed. This system ensures that each family can produce and benefit from their own seeds, while setting aside part of that production to bolster a collectively managed community stock. The idea behind the banks is to give the families autonomy at the moment of planting, thus freeing them from dependence upon local politicians who exploit the scarcity of seeds to practice cronyism. The banks also serve to encourage the collective stockpiling of seeds for use in times of shortage, which also avoids families having to use up their planting reserve to cater for their own food supply. As such, the banks are of a technical/organizing character – as the collective management of stocks of diversified genetic material –; and of a political character – insofar as they give rural farming families autonomy in terms of seed supply<sup>57</sup>.

56. Finality of the technical cooperation agreement between the State Government (Clauses I and IV), through its Secretariat for Agriculture, Irrigation and Supply, with *Articulação do Semi-Árido Paraibano* (Articulation of the Bushlands of Paraíba), through *Assessoria e Serviços a Projetos em Agricultura Alternativa* – AS-PTA (Counsel and Services for Projects in Alternative Agriculture), as the latter does not have legal status. These terms were signed to in 1999.

57. On the role, origin and possibilities of the CSBs, and for more information on local seed varieties, see: ALMEIDA, P. & CORDEIRO, A. *Sistema de Segurança da Semente da Paixão: apoiado por Bancos de Sementes Comunitários*. AS-PTA June 2001.

This reflection began with the Articulation for the Bushlands of Paraíba's first meeting on Seeds and Public Policies. The main objective of this meeting was to create a forum for the political formation of the organizations involved in the seed distribution program, thus strengthening the community seed banks and the organizations of the farming families while, at the same time, defining the directives for a sustainable public seed policy for the state of Paraíba. It was at this time that the various consolidated experiments with seed banks were socialised in the form of the Seed Bank Network.

The most important thing to come out of this was the dawn of the construction of a proposal for a public seed policy whose prime concern was not simply to distribute seeds, but to focus on combating the erosion of the genetic base and on conserving the biodiversity of family-based agriculture.

In the Northeast, government policies have proved one of the major vehicles for the genetic erosion of diversity, serving only to intensify the strain placed upon agro-biodiversity resources. Based on a technical/scientific focus that aims towards the artificial standardization of environmental conditions so that the genotypes can manifest their full productive potential, these policies lead to the substitution of local varieties with others genetically prepared to thrive under the



The São Tomé Farm Community Seed Bank in the municipality of Alagoa Nova, in Paraíba.

intensive application of agrochemical products. By natural contingency, the same selective pressure that attempts to maximise the productive potential of the species grown by artificially standardising the environmental conditions also leads to a significant narrowing of the genetic base of the varieties from which the “enhanced” material comes. In this manner, the agricultural research policies, just like those for credit, rural extension and promotion, have had extremely negative effects on the conservation of the genetic heritage of traditional farming, with its far superior conditions for adaptation to the bushland ecosystems of Paraíba. To illustrate this point, in 1999, during the first agreement between Articulation and the government, the state program made available only 3 seed varieties to the local farmers: the Emepa 1 blackeyed pea, *carioca perola* bean and BR 106 corn seed, despite the fact that the Seed Bank Network had requested 71 varieties of 8 species. Each of the agreements between Articulation for the Bushlands of Paraíba and the state government up to 2001 were centred on the distribution of “certified seeds”<sup>58</sup>.

The Seed Network therefore needed to take one more step in the course of its development, which was to have the diversity of local seed varieties, those produced by the farming families – the seeds of passion – included on the governmental program.

The government only agreed to purchase seed from the farming families at the end of 2001, after a great deal of negotiation and conflict. Tensions ran so high that demonstrators even invaded the site of the Secretariat for Agriculture of Paraíba. Only then did Articulation and the State government reach a new agreement under which the government would supply 100 tons of “certified seed” to the Seed Banks, half of which (50 tons) was to come from the production of the farming families themselves. As the Seed Law prohibited the government from recognising and therefore also from buying seeds directly from the farmers because they were technically considered “grains”, the money had to be passed on for the seeds of passion to

58. ASA-PB sealed 4 agreements with the State government during this period: the first in 1999, then 2000 and 2001.



be purchased locally. In order to get round any legal problems that might have arisen under the prevailing legislation, the technical terminology used on both the agreement and the receipts was ‘acquisition of grain’. At the end of this covenant the organizations linked to the Articulation seed network were purchasing 66 tons of “seeds of passion” from local producers from different regions of the state and passing this volume on to the 220 community seed banks already established.

This was one of the most important points for the work of the Articulation for the Bushlands of Paraíba: awareness of the importance of biodiversity. It was the first time in the history of its government policy that the state purchased genetic material produced locally by family-based agriculture. It was also important because the bushland farmers themselves would be the ones using this material and because it meant the material could be bought from them directly, thus generating greater opportunities for profit, as the material had a higher commercial value.

In virtue of this pioneering initiative and the new political situation in the country, the activities of the Articulation for the Bushlands of Paraíba received recognition from various government organs (state and federal) for its contribution to the development of a sustainable seed program based upon the conservation of bushland biodiversity. Through its food security program (*Programa Fome Zero/Zero Hunger Program*), the Federal Government recognised the Community Seed Bank Network as a fundamental strategy towards food security<sup>59</sup>.

59. It is worth mentioning that in Brazil there has always been a hiatus between the formulation and implementation of policy [Cf.: FONTE, E. M. M. da. *Novo Institucionalismo: uma abordagem alternativa para análises da intervenção do Estado no desenvolvimento*. In: *Raízes*, revista de ciências sociais e econômicas. Volume 21; number 2; July-December 2002. (pp. 233-245)], nevertheless, the government and civil society are currently experimenting with new institutional possibilities, creating new and hitherto inexistent spaces for participation [Cf.: SANTOS, B. de S. (org). *Democratizar a democracia: os caminhos da democracia participativa*. Rio de Janeiro: Civilização Brasileira; 2002. (Reinventar a Emancipação Social: para novos manifestos. V. 1)], in which there is a calling for the experiences of civil society, a “social capital, that can serve as a reference for new public policies. [Cf.: LIMA, J. C. *A teoria do capital social na análise de políticas públicas*. In: *Política e Trabalho*. Year 17, number 17. João Pessoa: PPGS-UFPB, 2001. (pp. 46-63); & PUTNAM, R. D. *Comunidade e Democracia: a experiência da Itália Moderna*. Rio de Janeiro: FGV, 2000. (translation by Luiz Alberto Monjardim)].

Having managed to get the fight against hunger onto the government agenda, Articulation is now raising the debate on the character of the food security the community seed banks have delivered. In 2003, a proposal was drawn up whereby Conab<sup>60</sup>, as part of the Foodstuffs Acquisitions Program<sup>61</sup>, would buy the produce of local farmers in order to stock the banks with foodstuffs as well as seeds. The State Government also participates in this agreement by covering any costs that exceed the minimum price (standard for Conab acquisitions).

In this manner, 80 tons of 46 varieties of local genetic material are purchased per year. In 2003, more than 160 tons of local landrace seeds – the seeds of passion – were either planted or stocked by more than 220 Community Seed Banks.

On the other hand, the experiment of the Paraíba seed program has managed to influence the Foodstuffs Acquisitions Program to answer the national demand for incentives for the production and use of local variety seeds, leading to Conab's creation of an innovative mechanism for purchasing seeds from farming families.

## The growing mobilization of farmers: a change of law

It is worth emphasising that in the first negotiations with the government of Paraíba, the product purchased by the state was not registered as seed, but as grain, despite the fact that the product was used as seed. The intention behind using the designation 'grain' rather than 'seed' was to bring down the technical and commercial value of the biological resource. However questionable this practice was,

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60. *Companhia Nacional de Abastecimento* (National Provisions Company), part of the Ministry of Agriculture, Cattle farming and Provisions (Mapa).

61. *Programa de Aquisição de Alimentos* – PAA (The Foodstuffs Acquisitions Program) was set up in 2003 with the goal of encouraging family-based agriculture, including actions connected to the formation of strategic food stocks and the distribution of farm produce to people in a precarious situation in terms of access to food supply. The PAA is run by the *Companhia Nacional de Abastecimento* (Conab).

the government had the Seed Law to back it up. The technical conception of this official program was aligned with the very underlying principles of the two items of law that have most direct bearing upon the question of seed quality in agriculture: The Seed Law (*Lei de Sementes*) and the Crops Law (*Lei de Cultivares*).

According to the Seed Law in vigour at the time, before a variety could be reproduced and commercialised it first had to be recognised by research institutes and commissions from the cultivation sector that tended to be heavily influenced by the commercial interests of the large seed producing companies. Farming families are not represented on these commissions, so they have no one to argue in favour of their seed varieties, which makes it all the more difficult to have them included in the publications used as references for the recommendation protocols adopted by the rural extension and credit agencies. In addition, the fields used to produce the seeds require an extremely extensive inspection protocol, which makes it even harder for farming families to break into the market. The Crops Law further complicates matters by marginalizing local varieties through the rules adopted by the 'system for the protection of the varieties commercialised on the seed market'. In order to be registered on this system the seed variety has to meet genetic stability, uniformity and homogeneity criteria that are all but impossible for a landrace seed, which are characterised by ample genetic variability, i.e., by plant populations that are neither uniform nor homogeneous.

As they stood, these laws presented serious obstacles to the inclusion of local variety seeds on government seed credit and supply programs. At the same time they clearly ran counter to the national strategies for the conservation of diversity. In other words, the Brazilian legislation that regulated the vegetal genetic material produced, sold and used nationwide was at complete variance with the national law of the Convention on Biological Diversity signed in Rio de Janeiro in 1992.

In 2001, faced with the realization that any government seed program would have to comply with these legal stipulations and that this would pose a constant impediment to the community seed banks,

causing them to function outside the bounds of law, the Articulation of the Bushlands Seed Network envisaged a new political strategy: it had to change the legislation and rebuild it to suit the agrobiodiversity conservation strategies carried out by thousands of Brazilian farming families.

In the State of Paraíba, the farmers of the Seed Network managed to draft a Bill of Law that was sent to the Legislative Assembly. After a series of public hearings, with the participation of more than 1,000 people, the "Law on the Creation of the State Community Seed Bank Program and Other Measures" was finally passed in December 2002. This law deals with a series of steps to strengthen and create seed banks. Article 3 of this Law determines "the sustainability of the Program through the implantation of a system for the replenishment of seed stocks and the use of local varieties". In this manner Articulation has improved dialogue with the Government of the State of Paraíba, for which the seed banks and seeds of passion, once ignored and devalued by government members and agencies, now serve as a reference.

At much the same time the Federal Government proposed a new Seed Law creating the National System of Seeds and Seedlings, connected to the Ministry of Agriculture. The function of this system is to regulate all of the vegetal reproductive material produced, sold and used on national territory. Under this new law, the seed certification system became rather more complex, with a series of new requisites for seed production, including the listing of every single crop on the National Registry of Seeds and Seedlings.

In spite of all the problems this new law has caused farmers, an exemption was negotiated with the National Congress concerning Creole seeds. In summary, the Seed Law of August 2003 recognises a crop variety as local, traditional or Creole when it is "developed, adapted or produced by farming families, settlers under agrarian reform or indigenous peoples, possesses phenotypic characteristics clearly determined and recognised by the respective communities and, in accordance with Mapa criteria, in terms of its socio-cultural and environmental features, is not in any way substantially similar to

any commercial crops”<sup>62</sup>. This new law also determines that farming families, settlers under agrarian reform or indigenous peoples who “multiply seeds or seedlings for distribution, exchange or sale amongst themselves” are exempt from registration with the National Seed and Seedling System. The local, traditional or Creole seeds used by these communities do not need to feature on the National Crop Registry<sup>63</sup>. This measure therefore ensures that these varieties are eligible for inclusion on public financing or seed distribution and exchange programs on which the farming families participate.

## Lessons learned and perspectives for a seed policy

The Articulation of the Bushlands of Paraíba has thus managed to formulate a state law and participate in and contribute to the creation of a federal law. We could say that the experience with community seed banks and the politicisation of the farmers from the Seed Network were decisive in engendering the conception of Creole seeds incorporated into the new law. The national precedent Paraíba managed to establish by involving its State Government in the purchase of local seeds also facilitated the drafting of the regulations concerning landrace seeds.

It is difficult to establish statistically, but we estimate that most of the seeds used by Brazilian farming families come from the ‘black market’ and thus sidestep the legislation. This informal seed commerce goes on among farmers, at open fairs, in the street markets and social and community exchange networks for genetic material and thus constitutes an important format for the conservation of agrobiodiversity. In the light of the experience in Paraíba and all the capital accumulated by the farming families, it was possible to bring national law more closely into line with the Convention on Biodiversity,

62. See: Law nº 10.711, August 5, 2003. Chapter 1, Art. 2, XVI.

63. See: Law nº 10.711, August 5, 2003. Chapter III, Art. 8, § 3 and Chapter IV, Art.11, § 6.





Mobilization of Articulation of the Bushlands of Paraíba in defence of the seeds of passion in July 2004.

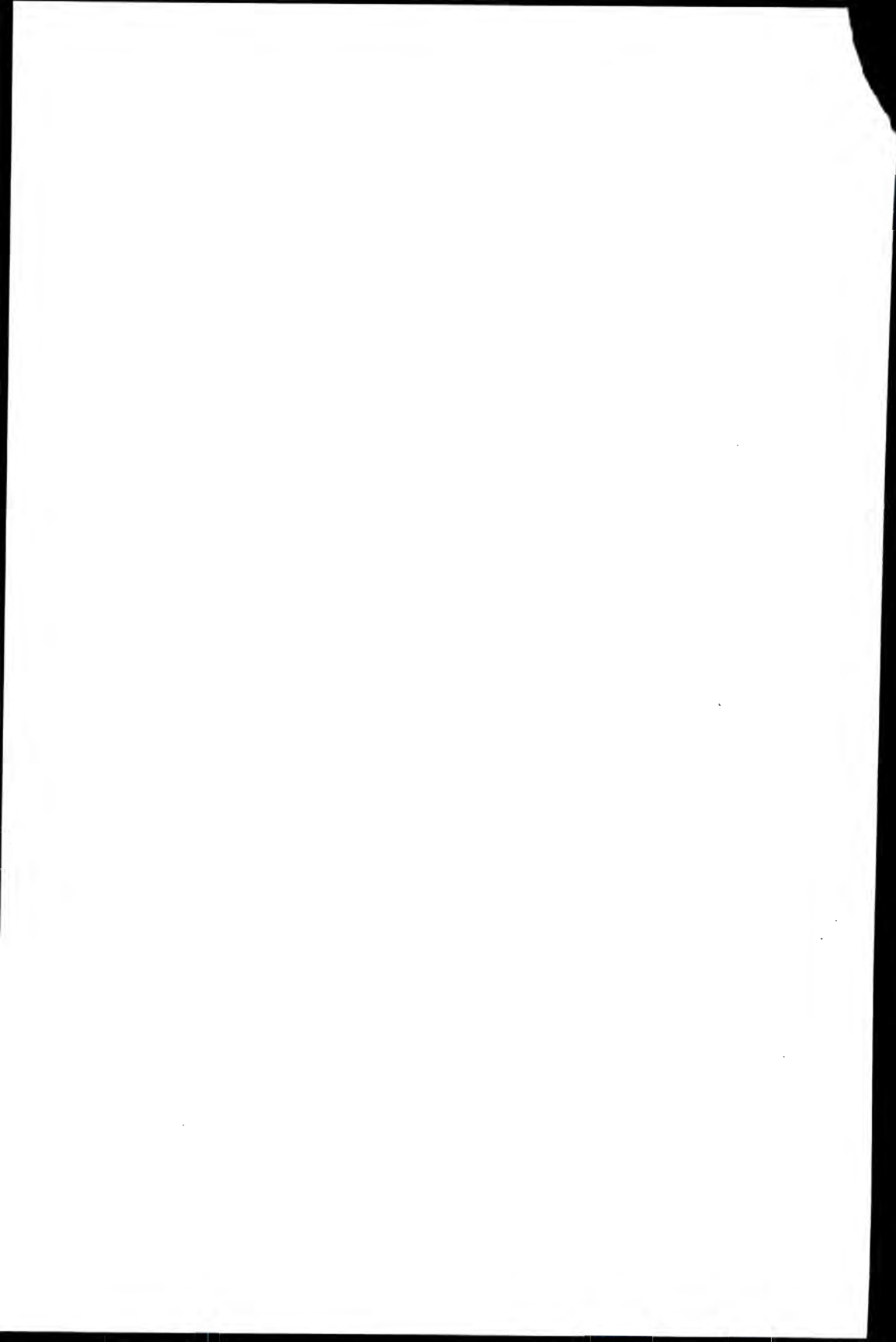
establishing greater syntony between these two legal standards.

That said, there is still a long way to go in terms of regulating these seeds, largely in terms of establishing the criteria used to define Creole or traditional varieties. In Europe, for example, a cataloguing system was created which allows for the registration of traditional varieties through socio-cultural descriptions provided by the farmers themselves. The crux of the process is to grant these seeds the greatest possible foothold in the market and to avoid creating situations that exclude these farmers and their agrobiodiversity.

The experiment in Paraíba shows the extent to which farming families possess a traditional knowledge with regard to the in-situ conservation of agrobiodiversity and complex individual and collective strategies for maintaining the genetic heritage they guard. Since its very foundation, the Seed Network has sought to qualify these strategies both technically and politically. With Brazil's adherence to the



Convention on Biological Diversity, this became an important instrument and political/legal reference for the recognition of farmers' rights and for defining and guiding the role of the State in the development of public policies on the use and conservation of agrobiodiversity.



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# Conservation of biodiversity in the hands of the banks

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Christopher Wells

As one of the main financiers of development, banks have a fundamental role in promoting sustainability. Their power to strengthen any given growth model is undeniable, be that a traditional model with enormous destructive potential or an alternative model with softer environmental impact. Aware of this responsibility, ABN AMRO has sought to support projects that promote the protection of natural resources. We clearly understand, however, that it is not enough to merely set aside an institutional budget for biodiversity conservation projects. Private institutions need to find ways to incorporate sustainability in all of their activities.

Towards this end, the Brazilian affiliate of ABN AMRO, Banco Real, decided to create mechanisms to encourage its clients to conserve native forests. We offer differentiated lines of credit to companies in the forestry segment who can demonstrate the sustainability of their undertakings. Likewise, those who do not offer concrete proof that they work the forests in full accordance with the law and at a pace that allows for the regeneration of the vegetation run serious risk of being expelled from the Bank's credit portfolio.

However, this is not simply out of the goodness of our hearts; there is growing evidence that companies that reduce emissions of pollutants, that handle natural resources with care and that respect their employees and the neighbouring communities stand a greater chance of prospering in the medium term. The organizations most

deeply engaged in sustainability also happen to be those with the most solid management. They receive fewer fines, are sued less often in the labour courts, are more productive and waste fewer raw materials. In addition, they manage to negotiate better contracts and find it easier to export. In short, they have lower credit risk, which makes them excellent clients.

This view gained force inside the Bank in 2001, when the ABN AMRO NV board of directors, based in Holland, decided to launch its Global Forestry Policy. The policy prohibits the financing of lumbering operations in native forest in all of the countries in which the institution operates. The rule does not, however, apply to exotic forests, such as teak, pine and eucalyptus. The policy also stipulates that we can only finance projects, whether in agribusiness or other segments, implemented in areas deforested within the last 5 years. Although this policy has existed for some time, financial institutions with similar initiatives are still rare.

In Brazil, the Bank adopted the same policy as the Head Office in Holland, but with one difference: it decided to permit the financing of lumbering in native forests on condition that the companies demonstrate the sustainability of their operations by obtaining some form of independent and fully recognised forestry certification, such as the Forest Stewardship Council (FSC) seal, for example. Banco Real also decided to maintain its relationships with companies that did not yet hold the seal, but which could offer some assurances that they had started the certification process.

Our initial intention is to maintain relations with these companies and exercise a positive influence by offering the means by which they can adapt to our socioenvironmental criteria. However, this is not always possible. If a company is not certified and has no intention of becoming so, then the order is clear: we must refuse credit. Approximately 15 clients have had credit applications turned down because of this kind of stance.

The demand for forestry certification is just one of the many socioenvironmental criteria we apply in our credit operations. We also refuse to work with companies that use slave labour or that produce

ammunition or firearms, among other standards. In addition, we also pay close attention to labour issues, work-related accidents, the emission of pollutants and soil contamination. In order to detect such occurrences, we conduct a detailed series of investigations that include consulting on the Internet and with government organs and non-governmental organizations, as well as interviews with the client and site visits.

Besides the introduction of socioenvironmental criteria in credit analysis, Banco Real also created a series of credit lines to finance businesses that promote sustainability. In general terms, these lines of credit offer individuals and companies attractive interest rates on medium- and long-term loans.

Since the creation of the Sustainable Business Development Area in mid-2003, more than 6 thousand contracts have been signed to finance projects in recycling, the generation of alternative sources of energy and the conversion of vehicles to run on natural gas, among various other activities, together totalling in excess of R\$ 132 million. Many of these initiatives bear direct relation to the conservation of biodiversity. One such case is forest handling and plantation. Projects in this area receive credit on condition that they possess forestry certification – regardless of whether they exploit native or non-native forests – and that they maintain the necessary reserve and minimum area of original vegetation as required by law. In short, the environmental requirements for the Bank's green credit lines are more exacting than those for normal credit.

Some of the resources applied through the Sustainable Business Development Area come from Finame (Financing for Machines and Equipment) and BNDES (Brazilian National Development Bank) and are earmarked exclusively for the conservation of natural resources and the control of pollution. The BNDES Environmental Line, which funds forest management and reforestation projects, is one such case. The Bank also offers Socioenvironmental CDC PJ, a product directed towards small companies interested in taking out loans on equipment for recycling and pollution control.

Recently, in October 2004, socioenvironmental lending received fresh momentum when the Brazilian affiliate of ABN AMRO sealed

an agreement with the International Finance Corporation (IFC), the financial wing of the World Bank, to secure US\$ 98 million for this portfolio. The agreement represented an historic moment, as it was the first time the IFC offered a bank the autonomy to conduct its own socioenvironmental risk analyses, something usually done by the IFC itself. This autonomy was granted after Banco Real's socio-environmental analysis procedures were submitted to intense scrutiny.

Though engaged in incorporating sustainability within its daily practices, the Bank is still mindful of the importance of social investments. Among the third sector projects the Bank decided to support is the Araucaria Forest Adoption Campaign run by *Sociedade de Pesquisa em Vida Selvagem e Educação Ambiental* – SPVS (Wildlife and Environmental Education Research Society). This Paraná-based non-governmental organization of longstanding tradition seeks to identify the last remaining fragments of araucaria forest and companies willing to adopt them as part of a wider conservation drive. All that remains of the country's araucaria forest is a mere 0.4% of the original cover, but with the Bank's institutional support, SPVS has already managed to seal 18 'adoption' agreements.

Such initiatives to assimilate sustainability within the life of the Bank are part of an effort that will surely grow in the future. The majority of financial institutions are still ignorant of the influence their decisions have upon the country's natural resources and genetic stock. However, the tendency is that the concerns of society will make banks increasingly more aware of, and more genuinely engaged in, the conservation of biodiversity.



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# The challenge of forming generations committed to defending our natural resources and sustainability

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Tomas Zinner

Owner of fabulous biological diversity comprised of the richest and most exuberant flora and fauna on the planet, Brazil still finds itself running up against historical limitations when it comes to fulfilling the task of preserving this inestimable natural heritage, a task that demands great effort, not only from the government sector, but also from private and third sector organizations aware that this is one of the main hurdles the nation must overcome in coming decades. This sense of urgency is due above all to the realization that, even now in the 21<sup>st</sup> Century, despite the wave of global awareness about the scarcity of natural resources, our ecosystem is still treated – on a large-scale – with purely exploitative interest. More worrying still is the fact that it does not receive due attention from its main benefactors – the Brazilian population.

The solution capable of turning this outlook around is well known. We have to approach the problem by strengthening its most solid link: citizenship. The way out therefore lies in heightening awareness of the ecological issue, instilling the fundamental concepts of environmental protection within present and future generations and making perfectly clear the impacts environmental devastation could cause to our medium- and long-term sustainability.

Whether independently or in an articulated manner, the public and private sectors have been working towards this goal through actions that seek to stimulate and disseminate the conservation of

our biological diversity and thus guarantee the highly strategic character of these policies, as occurs in more developed nations. Many initiatives have brought about considerable advances in this area, but in the corporate sphere the experience of *Instituto Unibanco* (Unibanco Institute), as the organization in charge of running the activities of one of the first companies to take up a position in this trench, as well as for the relevance and diversification of its contributions, has been particularly significant.

The social wing of the Unibanco conglomerate, the Unibanco Institute, created in 1982, integrated its social responsibility initiatives with the environmental defence and education projects of *Unibanco Ecologia* (Unibanco Ecology), a model program that has set new paradigms on this front to add to those the entity has already established in other areas.

Since the 90s, in parallel with the endeavours of Unibanco Ecology, launched at the beginning of the decade, the Unibanco Institute has developed an advanced educational policy that has contributed to the success of such programs as Solidary Literacy, which targets the reduction of illiteracy rates, and has also supported innovative and multipliable projects focused on introducing teenagers and young adults into the job market, thus promoting citizenship and encouraging environmental education.

In the space of two years the entity quadrupled the number of beneficiaries of its programs, rising from 7 thousand in 2002 to more than 31 thousand in 2004. Today, some 50 thousand teenagers and young adults receive the Institution's support through the 23 projects its makes possible through partnerships with other organizations and the use of its own resources.

## The theme of ecology

Based on a policy complementary to that used to treat the problem of formal education, the focus of the Unibanco Institute's educational projects, Unibanco Ecology was created in 1991 around a concept

of environmental education oriented towards involving and sensitising the population as to the complexity and importance of our biodiversity. The idea was to make the largest possible number of people aware of the importance of acting in the defence of all forms of life, and to spread knowledge of the causes and effects socioenvironmental impacts can have on flora, fauna and human wellbeing.

The fact that it was run by a private Bank contributed decisively to the success of this strategy, as it enabled the project to reach the hundreds of cities and towns in which the Bank is present nationwide, turning it into a relationship channel on environmental practices open to the Institution's various publics – clients, collaborators and their communities.

Once up and running, Unibanco Ecology began to lend nationwide support to the creation of dozens of native and medicinal seedling nurseries, the recovery of ciliary forest and the arborisation of urban roadways and stretches of highway. It also supported selective garbage collection programs, encouraging recycling in residential complexes and schools, both by sponsoring educational campaigns and by donating funds for the purchase of recycling machinery and equipment.

Over a decade of existence, the program received 2,500 investment proposals, of which 280 were put into practice throughout 135 municipalities, mostly in the states of São Paulo, Rio de Janeiro and Rio Grande do Sul, where activity was most intense, but in the remaining regions of the country as well. Of the projects realized, 24% were specifically in environmental education. The proposals were submitted to the Institute by associated NGOs and environmental entities, town councils, schools, universities, churches and clubs seeking a better quality of life for their communities.

The mechanism was simple. The entities looking for sponsorship took their proposals to their nearest Unibanco branch, where the manager received the project, made an initial appraisal of the case and sent the material to Unibanco Ecology at its headquarters in São Paulo. Once approved, the branch that indicated the project became its “sponsor agency”, which meant it was responsible for monitoring the activities in conjunction with the entity receiving backing.

In general terms, Unibanco Ecology favoured small projects, but could also back larger initiatives so that small, medium and large towns and cities could reap the benefits of the program. Among the undertakings that featured in its range of initiatives were the protection of potable water sources and riverbank forest, waste management, the recovery of degraded areas and even the creation of ecological reserves. The processes were always connected with environmental education, whether through courses and exhibitions or through the installation of specific centres.

### Emblematic actions

Among the en masse environmental education projects supported by Unibanco Ecology is the Tietê River Recovery Program in São Paulo, which, given its amplitude and level of public engagement, has become one of the private initiatives with the greatest levels of repercussion in the history of Brazilian environmental preservation. Soon after work got underway in 1991, the *Núcleo União Pró-Tietê* (Pro-Tietê Union Centre), directed by *Fundação SOS Mata Atlântica* (SOS Atlantic Forest Foundation), one of the first NGOs for environmental defence in the country, rallied the São Paulo population around the issue of recovering this river, one of two that cross the city.

With car bumper stickers, reports in the media and campaigns on TV and radio, the endeavour won the people over, attracting more than 1 million signatures (200 thousand more than expected) to what became the longest petition ever heard of at the time. The campaign received support from *Rádio Eldorado* and *O Estado de S. Paulo* news group, as well as the robust participation of Unibanco staff, all engaged in educational programs conducted along the banks of the River Tietê. The movement also led to the São Paulo State Government's commitment at the Rio-92 summit (United Nations Conference on the Environment and Development) to launch, with the financial backing of international agencies, the River Tietê Depollution Program.

This undertaking was the precursor of a series of other en masse education activities, such as the environmental education campaigns run at beaches in Fortaleza, Recife, Rio de Janeiro, Florianópolis, Vitória, São Sebastião and *Ilhabela* on the São Paulo coast.

## Broadening horizons

After a decade of activity, it was decided that Unibanco Ecology should focus its efforts exclusively on promoting environmental education. This initially involved lectures, courses and theme weeks, though later expanded into an ampler formulation with the establishment of the Environmental Education Centres now present in 13 municipalities.

In 2002 the Unibanco Ecology concept was completely remodelled and incorporated by the Unibanco Institute, which gave broader scope to its activities. Environmental Education, mainly that promoted through the Centres (EECs), acquired strategic intersection on projects hitherto exclusively educational, thus widening the reach of its actions.

The positive effects of this new directive could be assessed at the First Self-Sustainability Meeting of Environmental Education Centres held in São Paulo in September, 2004. The 26 managers from 13 centres present at the meeting had the opportunity to exchange experiences and receive guidance on project planning and execution, fund raising, project monitoring and assessment and the management and development of skills and competencies. The meeting also saw the creation of Uniceas (Unibanco Network of Environmental Education Centres), a reaffirmation of its commitment to strengthening these structures by participating in the organization of their activities, continuously training their administrative and pedagogical teams and donating resources.

In addition to encouraging environmental education centres, Unibanco Institute also looks to disseminate information on the theme among the school community in the hope of filling the gap left by a lack of literature on ecology at educational institutions.

Based on the realization that in the area of environmental education, as in any other discipline, the level of preparation of the teaching staff is key to improving the quality of teaching in the country, the entity decided to take action in this regard in 2003 by firming an agreement with the *Fundação Victor Civita* (Victor Civita Foundation), the group responsible for *Nova Escola* magazine. As a result of this partnership, each new edition of the publication now contains a pullout with four pages of clear and objective teaching material on the most important environmental issues as well as suggestions for classroom activities.

With nationwide distribution and a monthly print run of 600 thousand copies – which makes it one of the biggest communication channels with the Brazilian teacher – the magazine has brought valuable content on the theme of the environment to approximately 1.5 million public primary school teachers representing 25 million students, thus contributing to spreading environmental information among this enormous number of young citizens.

Some time after its implementation, the Unibanco Institute conducted a survey among teachers who read the magazine in order to assess the project's impact. The results showed that of the 83% of those interviewed who knew of the pullout, 70% had the habit of reading it while 56% had used the material to develop some classroom activity. The majority (62%) said that they collected the pullouts and 76% said they intended to use the material to prepare activities in the coming school year. These indicators are even more significant when we consider that the teachers who collect the magazine have been doing so for four years running.

## Without geographical limits

The multiple facets of ecological management have required that the Unibanco Institute consider the most diverse Brazilian realities, which often means it has to tackle necessities that vary according to the characteristics of each region and its own respective environmental and social vulnerabilities. Extending from populous urban centres to

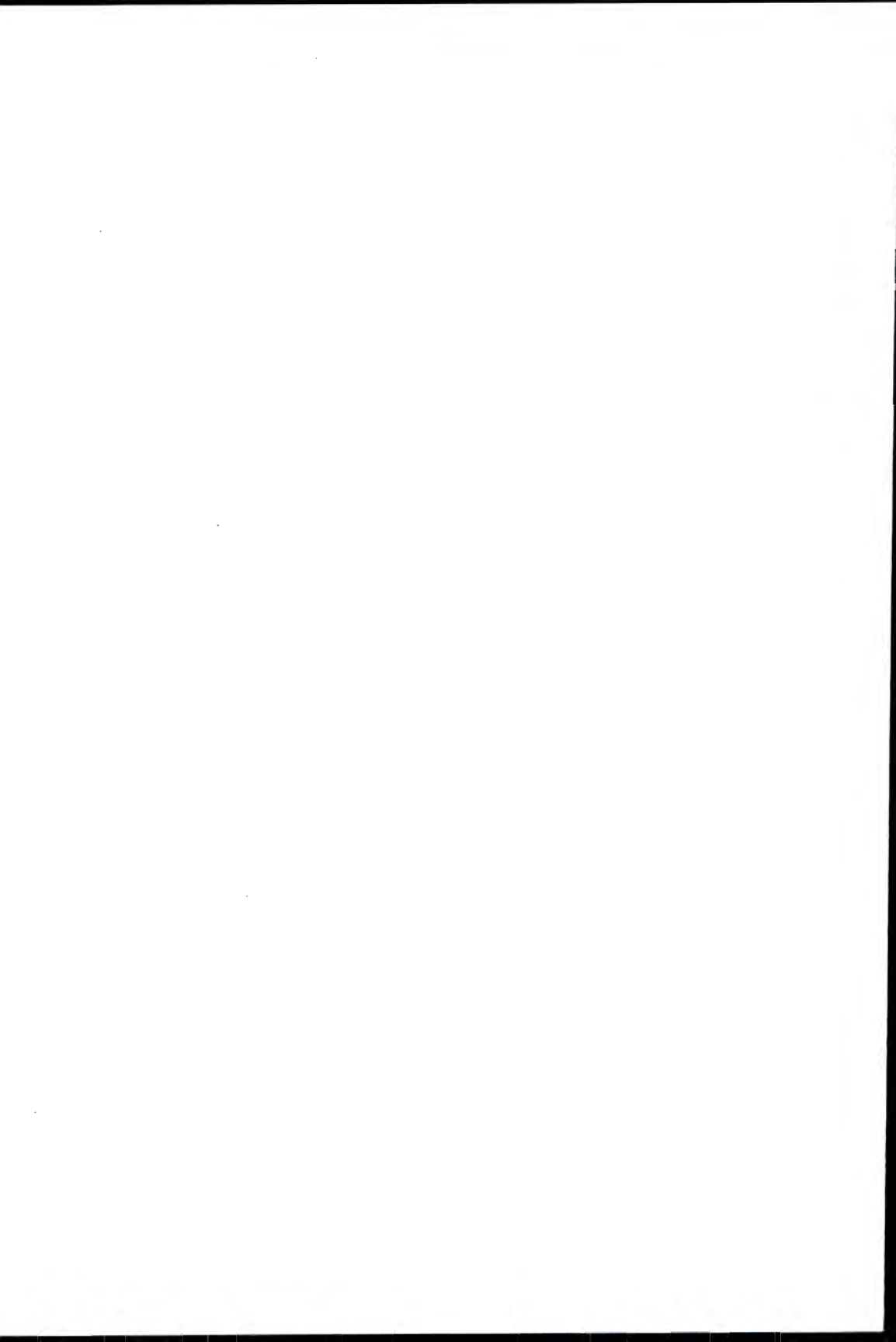


near-deserted rural areas, the actions conducted are always based on their own strategies, made possible through local partnerships.

In the Northeastern scrubland, the Institute's partnership with the *Associação Caatinga* (Caatinga Association), a Fortaleza-based organization for the defence of the Caatinga, a scrubland biome under serious threat of degradation, has proved decisive in guaranteeing the youth and families of Crateús in Ceará and Buriti dos Montes in Piauí the conditions needed to overcome the illiteracy, low income and sparse employment opportunities that go with the devastation of agriculture. Through the Young Nature – Serra Protection Program, which offers courses for the production of arts and crafts and other sellable materials, these people can acquire new means of subsistence and develop their self-esteem, thus strengthening their community as an agent of transformation.

In another geographical context, on a landscape that could not be more different, but which presents a socioenvironmental situation every bit as grave, lives the population of Vigário Geral, Rio de Janeiro, whose low per-capita income communities exist in precarious health and welfare conditions due to water shortages and an incipient sewage system. In order to address the most sensitive aspects of this problem, the Unibanco Institute established a partnership with the *Fundação Onda Azul* (Blue Wave Foundation), which works with recycling and cultural projects, on the Young Health and Environmental Agents Program. The training modules provide the participants with environmental knowledge that they can later transmit to the residents of their community, thus contributing with a significant step towards reverting this grim outlook.

It is through this set of initiatives that Unibanco Institute believes it plays a fundamental part in preparing youngsters and adults so that they can assume an active role in society and avail of strategic knowledge about our environmental heritage. In equal measure, the Institute creates centres of excellence and team training so that this work can advance. This is a circuit of interconnected initiatives whose end result is a single objective: to form citizens in the present to ensure the future of the nation.



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# Training in FSC certification and the conservation of forest resources

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Patrícia Cota Gomes and Luís Fernando Guedes Pinto

Forests contain much of the planet's biodiversity and are also responsible for conserving other natural resources and their associated environmental services. Through the extraction and management of wood or non-wood-based products, forestry activity can either contribute to the conservation of forest resources or towards their degradation or even eradication. Today, especially in the tropics, forestry activity is predominantly concentrated on logging, which is generally conducted in a predatory manner.

The Forest Stewardship Council – FSC certification was created with the objective of encouraging and differentiating forest stewardship that contributes to the conservation of natural resources (with special emphasis on biodiversity) and to the socioeconomic development of both the investors and the workers and communities involved in forestry activities. Among other indirect results, certification has helped identify knowledge gaps and promote the generation of new technologies, such as reduced impact exploration techniques.

However, if certification is to function as a catalysing instrument and promoter of socioeconomic/environmental change, the related parties must first know about the tool, its principles, objectives and functioning, as well as the benefits, opportunities and challenges they present. It was in this context that Imaflora – *Instituto de Manejo e Certificação Florestal e Agrícola* (Institute for Forest and Agricultural Management and Certification) created its Training

and Skills Program in 1996, whose public has included companies, family and community producers, public policy makers, workers and trade unionists, NGOs, financing agencies, researchers and students, media professionals, technicians, auditors and consultants. The Program's main activities are intensive 5 to 10-day courses, condensed courses, lectures and the production of publications. Wherever possible, these activities combine theory and practice and the application of knowledge through simulations and specific training.

Over these last nine years, more than 1,000 people nationwide, though particularly from the Southeast, South and North, have participated in twelve intensive courses, various condensed courses in universities and schools and dozens of lectures and other more sporadic contributions.

A recent survey carried out with participants on the intensive courses sought to identify their results in terms of certification and improved forestry management. The results showed that the majority of the enterprises in or around which the participants worked (71%) had begun the certification process, while 14% had already been certified. For 71% of the students, the course contributed to improving forest handling at their operations.

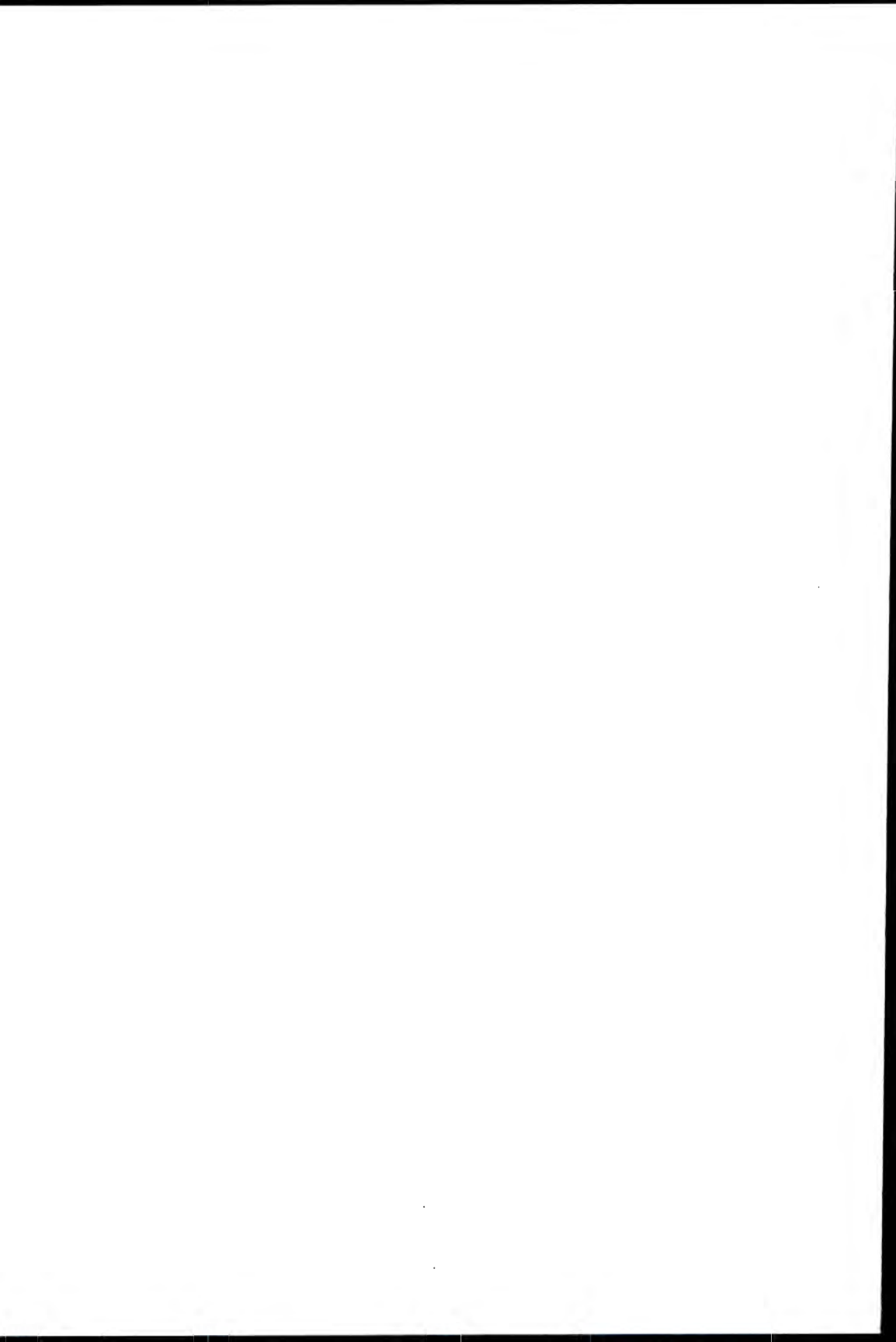
According to the survey, many of the participants (36%) work to facilitate the certification process, that is, they help prepare the operations for certification or to spread the theme among other interest groups (27%). Others (13%) work with certification policy, or in influencing forestry operators to seek certification, or as auditors on the certification process (11%). While most work on business projects in natural forest, others work with plantations and non-wood forest products and on community projects. The forestry operations are generally small to medium sized, though there were also some participants who work for or influence large companies.

In recent years, universities and technical schools have become a strategic public for the Program, as these institutions will supply the forestry employees of the future. However, certification has not yet been fully incorporated in the curricula at these schools, which is why we have sought to establish partnerships with universities

and schools throughout the country in order to offer condensed courses or even teach entire modules on the theme.

Another recent line of priority has been the production and distribution of publications that adapt the course content for different publics with a view to transmitting the knowledge Imaflora has accumulated, giving it a wider reach and reducing our dependence on administering on-site courses in order to fulfil the program's goals.

As such, we feel the Training and Skills Program has made a significant contribution to fostering an understanding of FSC forestry certification for all interested parties in Brazil and to the formation of human resources. Consequently, we also hope our activities have managed to generate a positive influence on the quality of forest stewardship in the country and contribute towards socioeconomic development and the conservation of natural resources, including biodiversity.





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# Sebrae's involvement with the ecobusiness issue

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Paulo César Rezende de Carvalho Alvim

## Introduction

From the 1990s, companies began to experience mounting pressure concerning environmental issues. New sets of instruments were made available to help companies meet these new market demands for greater respect for the environment, especially after the defining mark left by the Rio-92 Convention.

The challenge that then emerged was to make these tools available to smaller sized companies so that they would not be excluded from new market opportunities by these emerging environmental barriers.

The aim of this report is to present a taste of what the Sebrae System has been doing in this area, which has resulted in a line of focus on ecobusiness as a way of working the question of sustainable development among Small and Medium Enterprises (SMEs).

The reality of the Brazilian SMEs reveals a set of bottlenecks that stand in the way of the competitiveness and sustainability of these companies:

- Market access;
- Low educational level of their leaders and workforce;
- Access to information and knowledge;
- Access to and use of technology;
- Low innovative capacity;

- Access to credit;
- Credit opportunities inappropriate to the reality of the SME;
- Little use of business management methods and technologies;
- Little use of information and communication technologies;
- Absence of a culture of cooperation;
- Insufficient political representation;
- Excess bureaucracy;
- Inadequate taxation environment.

Parallel to its actions of direct support for SMEs, these points have led Sebrae to work politically towards developing a context more conducive to the success of these companies, searching for a more favourable business environment.

The strategies to increase the economic participation of SMEs find their leverage in the process of aggregating value, particularly through access to and use of knowledge that harbours the conditions for innovation. Adapting knowledge management for SMEs and increasing innovative capacity contribute in a very effective manner to the competitiveness and sustainable development of these companies.

The gradual nature of this process, which passes through various stages in an evolving and aggregate manner, from mobilization through to RD&E (Research Development & Engineering) activities, indicates the need for favourable conditions for innovation created through cooperation, sharing and partnerships with the country's ST&I (Science, Technology and Innovation) Network, through whose existing infrastructure knowledge and innovation can be generated, developed and disseminated amongst the SMEs, thus increasing their capacity for innovation.

Environmental management is one such window whose potential needs to be explored in conjunction with SMEs.

## Action in Environmental Management

Action in environmental management at Sebrae stems from the hard work done in the 90s to bring quality to SMEs and is the fruit

of the experience of Sebrae units and federal universities in activities focused on skills training and consultancy in the rational use of energy and the rationalization of production processes at small companies.

The influence of Rio-92 and the beginning of the ISO 14000 discussions caused Sebrae to bring forward its plans to develop a set of tools for environmental management systems adapted to the reality of the SME.

In 1995, with the opportunity for Sebrae representatives to accompany Brazilian technical missions to observe what was happening in environmental management on the international level, especially in Europe, and with the added incentive of the initial ISO 14000 discussions, *Sebrae Nacional*, mainly through the Sebrae DF (Federal District) team led by Superintendent Nilton de Castro, resolved to develop a set of environmental management support tools for the SME.

Thus, in 1996, a pilot environmental auditing project for SMEs was set up in partnership with CNPq (National Council for Scientific and Technological Development), IEL (Euvaldo Lodi Institute), Ibama (Brazilian Institute for the Environment and Renewable Natural Resources), the Ministry of the Environment and Infraero (Brazilian Airports Association), with Sebrae DF as its main executor, with the following results:

- Preparatory critical environmental analysis carried out at 21 small companies located in the states of Amazonas, Bahia, Ceará, Distrito Federal, Espírito Santo, Maranhão, Mato Grosso, Goiás, Minas Gerais, Pará, Pernambuco, Rio de Janeiro, Rio Grande do Sul, Santa Catarina and São Paulo;
- Publication of '*A questão ambiental – o que todo empresário precisa saber*' (The environmental issue – what every businessperson needs to know), with national print runs and adapted to the Federal District;
- CD-Rom and primer entitled '*Iniciando Gestão Ambiental*' (Beginning Environmental Management); and
- Poster and folder for the program '*5 menos que são mais – água, energia, matéria-prima, lixo e poluição*' (5 less meaning more – water, energy, raw materials, rubbish and pollution).

In 1997, on the spur of this experience, Sebrae embarked on the implementation of environmental performance improvement plans and environmental management systems (SEM). In 1998 came the publication of the book '*A questão ambiental e as empresas*' (Companies and the environmental issue). In 1999 the first environmental management plan was implemented in Goiás, which served as a test and permitted the dissemination of the Sebrae System, involving 3 courses in environmental auditing (60 people trained) and, in 2001, a further three classes with focus on environmental management.

From November 2000, EMS implementation processes got underway at one company in São Paulo (mercury residues), six in the Federal District and one in Goiás (asphalt). The companies in Goiás and São Paulo also had support in their pursuit of ISO 14000 certification. In 2001 work began at the cooperatives in Brasília and Xapuri in Acre and, in 2002, at the Tijuca National Park in Rio de Janeiro and at Coplast (plastic waste recycling) in Amazonas. Also in 2002, Sebrae DF published the book entitled '*Sistema Integrado de gestão – meio ambiente, qualidade, saúde ocupacional, segurança e responsabilidade social – conceitos, definições e termos usuais*' (Integrated management system – the environment, quality, occupational health, safety and social responsibility – concepts, definitions and common terms).

To the present day, a further 12 environmental performance improvement plans have been completed and the System has the Sebrae methodology at its disposal for the development and implementation of Environmental Management Systems composed of the following:

- Manual especially for the businessperson;
- EMS development and implementation methodology;
- Environmental awareness material;
- ISO 14001 analysis and interpretation course;
- Course for the formation of internal auditors;

In recognition of this work, in 2001 Sebrae DF received third prize in the Humanity category of the Von Martius Environmental Award, hosted by the Brazil/Germany Chamber of Commerce, for the

Sebrae Environmental Management Program. This material was entirely updated in 2004 and is now available on the Sebrae System website.

In parallel, in 1999, Sebrae established a declaration of intent with CEBDS – *Conselho Empresarial Brasileiro para o Desenvolvimento Sustentável* (Brazilian Business Council for Sustainable Development), CNI (National Industry Confederation), BNDES (Brazilian National Development Bank) and Senai (National Industrial Learning Service) to set up regional cleaner production centres.

The first phase of this project saw the implementation of centres at the Mato Grosso Industry Federation, which specialised in the forestry sector, at the Euvaldo Lodi Institute in Santa Catarina, the Senai-Cetind in Bahia, the embryo of the Bahia Clean Technology network (rede Teclim), and at the Minas Gerais Industry Federation, which initially attended 12 leather companies and is now developing a CNI-Sebrae project with 17 companies from the Local Production Arrangement (LPA) for the furniture industry in Ubá and a further 17 companies from the shoe industry LPA in Nova Serrana, as well as conducting the environmental control plan for the ceramics sector with funding from Sebraetec – formerly PATME, and a project with fireworks companies in São Sebastião do Alto, with funding from the Development Bank of Minas Gerais (BDMG).

Through Sebrae RJ, the organization has also supported the implantation of the Rio de Janeiro Cleaner Production Centre at Firjan (Federation of Industries of the State of Rio de Janeiro) and has been following the experiences of CEBDS with the BNB (Brazilian Northeastern Bank) in Pernambuco (at the Federal University of Pernambuco) and in Ceará (at the Federal University of Ceará).

In 2001 Sebrae evaluated the declaration of intent and embarked on the second phase of its partnership with CEBDS, which involved expanding the Brazilian Cleaner Production network, a process that has been underway since 2002, with actions implemented at centres in the Federal Universities of 10 states: Sergipe, Rio de Janeiro, Rio Grande do Norte, Mato Gross do Sul, Distrito Federal, Alagoas, Piauí, Amazonas, Amapá and Pará. The Espírito Santo centre joined the list in 2003.

All of this has been done through local awareness actions, the training of consultants and the articulation of local partnerships with a view towards implanting state centres. In 2004 a third phase of the CEBDS partnership was approved that envisages the expansion of the network of centres with the inclusion of 10 more federal universities. The process is currently underway.

Finally, Sebrae centres at federal universities have also been conducting environmental actions aimed towards the reduction and reuse of waste, with a strong emphasis on the generation of employment. The initiatives of the following Sebrae units deserve special mention in this regard: Sebrae PR (recycling and reuse of waste), Sebrae RJ (guide for the garbage collector co-op, the Bio-Awareness Program, the Recycling Program, '*Brinquedoteca viva*' – Toy Library Program, Pro-recycling Program, garbage consortium, recycling stations), Sebrae AP (garbage collectors), Sebrae ES (arts and crafts from collected garbage), Sebrae GO (virtual waste scholarship and selective garbage collection co-op), Sebrae RO (recycling co-ops), Sebrae DF (waste reduction at SMEs, waste reduction and materials management in civil construction, the clean rubble program and 100 dimension co-op), Sebrae AL (recycling) and Sebrae SP (recycling).

## An eye on ecobusiness

In the identification of information and knowledge flows in the business environment what stands out is the necessity for innovative capacity that can guarantee sustainability for these organizations. The companies must position themselves on the market in a manner that accentuates a certain differential.

Sustainability understood as an integrator of human, social, economic and natural capitals is described in Figure 1 below.

The analysis of the practices of leading companies in terms of how they spread scientific and technological knowledge is the basis from which to define the limits of the innovation process grounded in relationship flows and networks that create an environment that is



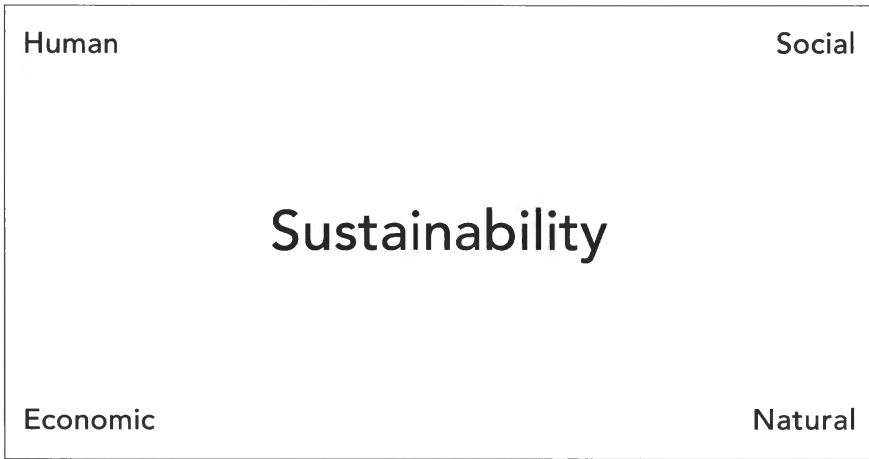


Figure 1 – The integration of capitals for sustainability.

favourable to innovation. Departing from the premise that innovation is the vector that guarantees sustainability, an innovation-friendly environment helps secure the sustainability of ventures. Innovation is here understood as a systematic phenomenon in the sense that the processes that generate new products and processes within the company sphere are themselves generated and sustained by business interrelations and a complex network of inter-institutional relations.

One of the fundamentals of the competitive environment of today's business world is the migration of development models that come to rest upon intangible aspects and the transition from the old world of comparative advantages to a new context of competitive advantages, here understood as factors that aggregate value to goods and services, that give an edge to production and guarantee sustainability to the organizations. Business becomes more complex and moves more quickly, bestowing a new dynamic upon the entrepreneur and creating a new basis for business competition.

Competitiveness is interwoven with the performance of the organizations and the economic and social agents. Competitiveness that integrates the functions of competition and productivity, where productivity is understood as the value of what is produced per unit of work or capital, which depends as much on the value of the products and services as on the “effectivity” (efficiency + effectiveness) with which they were produced.

Competitiveness occurs on three levels:

- Systematic, understood as the environment of facts arising from uncontrollable variables. These are factors external to the company, such as laws, the economy and technology, based beyond the business sphere and the sector in which the company works, being directly related to the macro-economy, political/legislative events, economic and social infrastructure, demographics, cultural aspects and nature;
- Structural, which refers to facts related to the production chain of which the company is a part, to the sector in which it operates and its territorial localization, as the company also interacts both locally and sectorily, breaking with the old logic that its only relationships are competitive; and
- Business, related to the company itself, with focus on management systems (human resources, logistics, information systems, distribution channels, among others), business theory and strategic decisions and entrepreneurial attitude, all of which can be expressed through productivity and quality indicators.

It will be noted that this new approach to competitiveness is ampler, following from an ambient vision for competitiveness, which incorporates connections with location marketing and innovative capacity, as well as the aspects that create a favourable environment for the sustainable development of production.

Among the fundamentals of sustainable development is the creation of favourable environments for competitiveness, in which innovation becomes a factor of success, the pursuit of which, par-

ticularly on behalf of those considered world-class companies, has for some time taken as its starting point the presupposition that excellence is the best protection against global competition.

On this point, it is worth highlighting that, departing from the notion that organizations are a set of individuals using resources to reach goals, some of the precepts of the life sciences, which extol the theory of the lifecycle of the organization, could be used as a base from which to rally efforts towards sustainability on the part of these organizations. Sustainability, which is obtained when the organization manages to attain and maintain its operations at pinnacle levels, is something that requires it to change direction when necessary and when it so desires.

Interaction with the market and with the competencies available becomes a reference point for the competitiveness of organizations, giving rise to the need to work with models centred on productive complementarity, research, development and engineering (RD&E)

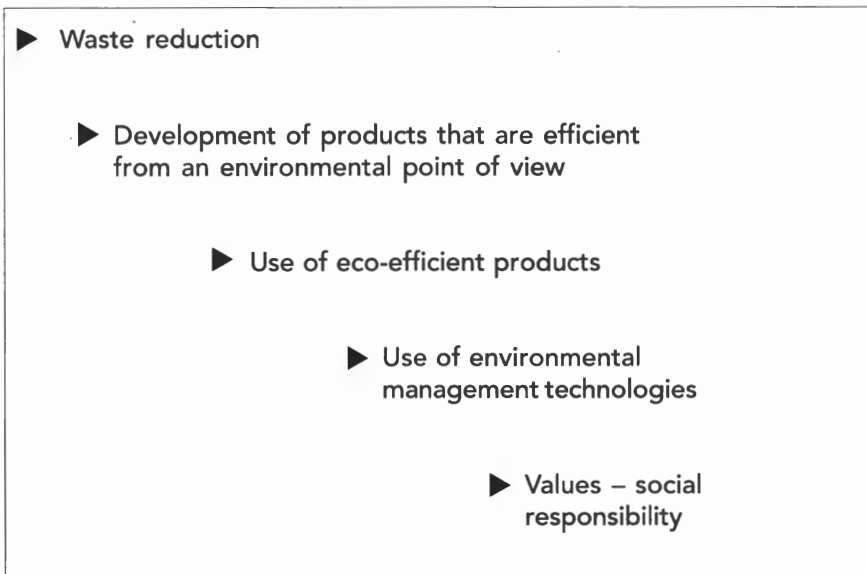


Figure 2 – Waste reduction.

and on the capacity to identify business opportunities. Departing from the vector of innovation, one can see that, in order to be successful, organizations have to do something different, with this differential becoming the essence of a new technical/economic cycle known as the information or knowledge economy. In other words, knowledge becomes the new basis of wealth.

When one thinks of innovation and the environment, one thinks of the need for strategies to instil companies with these concepts, for which, based on the experience of the Sebrae System, a model focused on the principles of eco-efficiency and business, referred to here simply as eco-business, is recommended.

One can see from Figure 2 that one of the forms for the real engagement of SMEs with environmental issues comes through the financial impact they have on companies. For example, successful waste reduction initiatives will yield immediate impact. Following on from there is a cycle that moves through the product/productive process and management technologies, leading naturally on to business values and respect for – and the protection of – the environment.

This has been Sebrae's line in what is fast consolidating as the Sebrae eco-business line, which is based on the following actions:

- Waste reduction campaigns;
- Studies on eco-business chains;
- Environmental entrepreneurship;
- Eco-efficiency;
- Agenda 21 for SMEs;
- Remote environmental education for businesspeople;
- Environmental management – training and consultancy; and
- Environmental certification.

This is the proposal the Sebrae System has been taking to various parts of the federation. Below are recommendations for some initiatives designed to generate income where there was none before or to aggregate value to existing endeavours through an environmental outlook, as well as to aid in the search for inclusive sustainable development.

## Eco-business case in the Sebrae System

### 1. *Garbage-based products (particularly urban garbage)*

The issue of generating income for marginalized portions of the urban population has led increasingly larger contingents into activities related to garbage collection. In response to this reality, Sebrae created a set of activities to organize garbage collectors into cooperatives, followed by diversification into possible applications for the collected waste. The 100 dimension co-op in Brasília is a perfect example. Today, the project is a reference in the area of environmental management and the diffusion of social technologies.

### 2. *Bio-trinkets*

The availability of forest residues, particularly seeds, has given rise to the development of a market for bio-trinkets, which basically amounts to generating income out of nothing. This activity, aided by the contribution of designers, has produced collections of jewellery with extremely high added value.

### 3. *Biopharm products*

The biodiversity of our ecosystems, many of which are little known from the points of view of science and economic potential, has created opportunities for small companies, many involving incubators, in the development of pharmaceutical and cosmetic product lines, particularly in the Amazon region.

### 4. *Vegetal leather*

Better use of latex led to the development of vegetal leather, an experiment carried out in Rondônia, where the contribution of stylists has enabled the manufacture of some lines of clothing, as well as experiments in accessory lines.

### 5. *Organic products*

The demand for organic products is showing constant growth and the advantage for small companies is that the production of these products lends itself well to the SME. Experiments in rural sustainable development, like those carried out in Santa Catarina, have increased and added value to the output of the small rural producer.

### 6. *Tropical flowers*

Brazilian flora has unique characteristics, amongst which diversity and colourfulness are particularly strong points. There is also significant space for the small producer in this activity. More than 20 projects with ornamental plants are currently underway nationwide, including the well-known work of the producers in Alagoas, whose fame has even reached overseas.

### 7. *Wild honey*

The food of the gods, there are many Brazilian regions with significant potential for the production of wild honey. The work underway in places like Picos, in Piauí, besides being a hallmark of quality, has also established this activity as an element for the promotion of social mobility.

## Conclusion

This brief account has presented what Sebrae has been doing in recent years in the area of environmental management and eco-business development, with a strong focus on the inclusion of the theme on the agenda of SMEs, as part of its effort to make environmental management a competitive differential for these companies, thus collaborating towards higher quality of life for society, increasing the sustainability of the SMEs and generating wealth and employment



through an ecologically correct line of products and socio-productive inclusion.

Despite Sebrae's contributions, the challenge is still daunting, whether in virtue of the diversity of the SMEs or through the sheer quantity of companies, making it all the more important to develop these actions in partnership with institutions that possess a thorough knowledge of the area and immense respect for our biodiversity.



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# Program for the Conservation of Biodiversity at World Natural Heritage Sites in Brazil

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Celso Schenkel

On the initiative of the Ministry of the Environment, in partnership with Unesco-Brazil, the WWF, the World Heritage Centre – WHC/Unesco, Conservation International (CI) and The Nature Conservancy (TNC), the “Program for the Conservation of Biodiversity at World Natural Heritage Sites in Brazil” was set in motion in 2001, fruit of the convergence of commitments required by the Convention on Biological Diversity (1992) and the Convention on the Conservation of World Heritage (1972).

Planned to extend over a period of ten years, the objective of the Program is to develop mechanisms, competencies and capacities for the conservation of biodiversity and the coordinated management of the various Brazilian sites declared World Natural Heritage. Structural actions are planned to make this coordination viable on national, state and municipal levels and will encompass the technical, administrative and financial management of undertakings to protect species and ecosystems, promote public awareness and environmental education, and stimulate ecotourism and related training, among other sustainable socioenvironmental development initiatives.

The Program is an important part of the Brazilian effort towards sustainable development and relies upon government funding through the Ministry of the Environment and Ibama, as well as from the above-mentioned NGOs, to the tune of \$ 2,260,000.00 and reflects the commitment of each CBD signatory to “undertake to provide,

in accordance with its capabilities, financial support and incentives in respect of those national activities which are intended to achieve the objectives of [the] Convention [...]”, as described in Article 20, “Financial Resources”.

The Program was submitted to the United Nations Foundation (UNF) in a bid to secure more funding and received a commitment for 1:1 matching, which means that the UNF, through the United Nations Fund for International Partnerships (Unfip), agreed to pay one dollar for every dollar the partners invested in the Program. The Program’s funding therefore totals \$4,500,000.00, with the potential and scope for further financial contributions.

The differentiated origin of these resources and the demands of the donors involved have required the creation of two instruments with complementary operational dynamics for the management of the funding for Phase I of the Program, which is expected to take 4 years<sup>64</sup>.

The support from the Brazilian government comes through a Technical Cooperation Agreement between the Ministry of the Environment, the Brazilian Cooperation Agency and Unesco, with resources from the Union budget. Another project stipulation agreed between Unesco and the UNF, and mediated by the Brazilian government, regulates the flow of resources from all sources, including donations from NGOs. The UNF, for its part, pays the amounts it matches against the sums deposited by the other partners to Unesco through its World Heritage Centre.

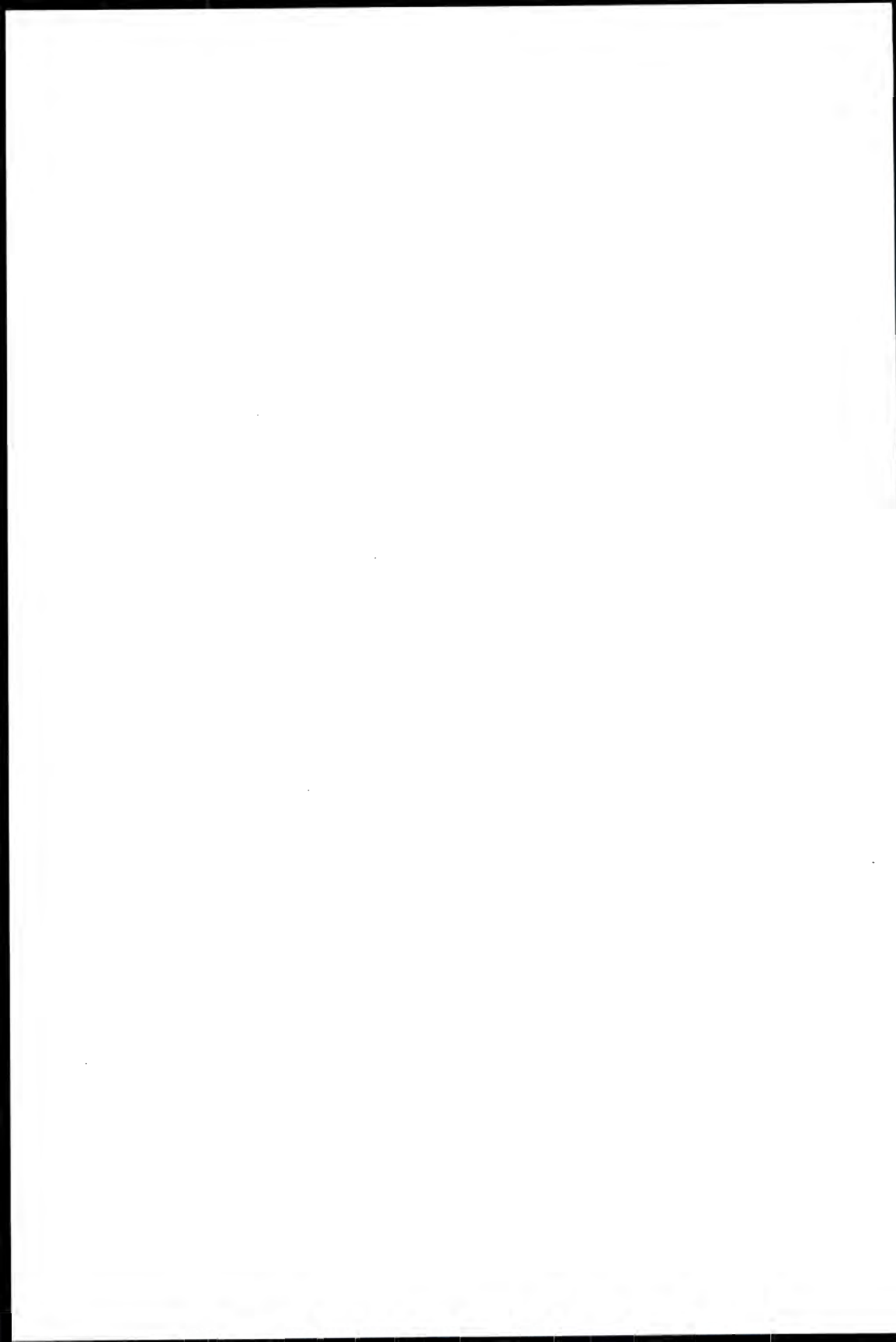
Unesco Brazil functions as a point of convergence for all parties involved in the Program, catalysing the actions and technically and financially managing its constituent projects. As it has experience with similar technical cooperation projects, including some previously conducted with the Ministry of the Environment, Unesco has

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64. Phase I covers five sites recognised by the Unesco World Heritage Centre (WHC/Unesco) prior to the year 2000: the Iguazu National Park; Costa do Descobrimto/Atlantic Forest Reserves; Atlantic Forest/ Southeastern Reserves; the Pantanal Conservation Area and the Jau National Park. Two other areas recognized as World Natural Heritage Sites since 2001 will be included in Phase II of the Program: Protected Areas of the Cerrado / Chapada dos Veadeiros/ Veadeiros National Park and Atol das Rocas.

developed agile and reliable management mechanisms for complex, large-scale projects. In addition to this, it has proven and recognised capacity to implement programs and projects associated with the environment and the sustainable management of natural resources, whether financed or co-financed by bilateral and multilateral agencies, as well as the flexibility, agility and neutrality needed to carry them out.

The cooperation actions also include supporting the development of strategic and operational communication and IT instruments with a view to subsidising and strengthening the decision-making mechanisms and promoting dialogue between citizens and public authorities, thus substantially improving governability and underlining the complementary relationship between public policies and international commitments.





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# The PPP-Ecos and CBD

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ISPN Technical Team

*Programa de Pequenos Projetos Ecosociais* – PPP-Ecos (The Small Eco-social Projects Program), as an incentive program for actions that promote sustainable livelihoods in the Cerrado scrubland, has contributed in singular fashion to the implementation of Article 11 of the Convention on Biodiversity (CBD). Article 11 defines how all CBD ‘contracting parties shall (...) adopt economically and socially sound measures that act as incentives for the conservation and sustainable use of components of biological diversity’.

PPP-Ecos is a pioneer and remains the only project support program exclusively focused on the Cerrado scrubland, a rich biome that is globally important for its size, ecological diversity, carbon deposits and hydrological function in the South American continent, as well as for its socio-cultural diversity. Nevertheless, it is also a biome severely threatened by an advancing agricultural frontier and relegated in importance by both public authorities and international organs.

Most of the projects supported and monitored by PPP-Ecos involve such activities as the extraction of native flowers and fruits, medicinal plants, the breeding of wild animals, beekeeping and meliponiculture, arts and crafts, ecological tourism and agriculture, among others. One of the objectives is to show the way towards a new model of development for rural livelihoods, one in opposition to the current Brazilian model based on monocultures in large areas, which favours the concentration of profits and generates social inequality.

## Contextualizing the PPP-Ecos

PPP-Ecos has been in activity since 1994 and, up to 2005, had supported 156 projects at an average cost of US\$ 25,000 across 14 states in the Cerrado scrubland region, totalling close to US\$ 4 million. The Program began life as the Small Grants Program (SGP) run by the Global Environment Facility (GEF) and the United Nations Development Program (UNDP) and installed in more than 80 countries.

Today, PPP-Ecos is a Brazilian program that operates with support from such international benefactors as the SGP and Doen Foundation (Holland), sponsoring projects by non-governmental and communitarian organizations developing actions that promote a positive global environmental impact and the sustainable use of biodiversity.

PPP-Ecos prioritises proposals that (1) are based on community participation; (2) are innovative; (3) can be repeated in other places; (4) pay due consideration to harmonious relations between men and women in environmental conservation and social development actions.

After eleven years of PPP-Ecos, we can see that the environmental awareness its projects have generated amongst the participants serves as a nexus for innovations on the local level and has given the communities access to national and international sources of public funding. Likewise, the entities that receive backing generally go on to join networks or collective organizations through which they can exercise even greater influence on regional and national public policy.

### PPP-Ecos results and trends in Brazil

Given the Program's flexibility and minimal bureaucracy, agility and quality of performance have become its hallmarks in Brazil. This makes it possible for the program to match the speed with which degradation occurs in the Cerrado and act quickly in critical situations. On the other hand, the Program's flexibility enables it to assume the role of co-financer on new projects in order to complement other sources, including public funding.

In addition, PPP-Ecos has been extremely influential in overturning the relative invisibility the Cerrado has long endured, as well as in increasing the area of the biome currently under sustainable use regimes and in bringing production and commercialisation experiments to maturity through the balanced use of native biodiversity, thus setting itself against the current monoculture-based system in Brazil and the resulting unfair distribution of wealth.

In this manner we see the sustainable use of biodiversity emerge as a viable conservation alternative in significant areas of Cerrado scrubland and as a means of generating income, food security and quality of life for its traditional communities and farming families.

Initiatives such as arts and crafts, agro-extractivism, beekeeping, meliponiculture and the cultivation of medicinal plants have contributed expressively to keeping the Cerrado on its feet. Products like honey, chestnuts, fruit and cottonwood, among others, are well accepted on the market and bring perceptible improvements in terms of food security and quality of life for the communities. Furthermore, in dealing with species native to the Cerrado scrubland, those involved in the projects learn to value and care for nature and take up the fight against such damaging practices as deforestation, slash-and-burn clearing and the use of pesticides. In this manner, these activities have proved important to an increasing environmental awareness.

Along the same lines, the Program also supports projects related to tourism and others run in indigenous areas and rural settlements. The main objective is to make use of the legacy of these traditional populations' harmonious co-existence with nature and, by developing a local production based on the natural resources of the Cerrado, generate alternatives to ensure the social inclusion of these communities and to revert the current trend of ecological degradation. Tourist activities are also used as a means of promoting public awareness initiatives that not only contribute to the dissemination of environmental sustainability criteria, but also help further the social inclusion of the Cerrado communities.

In terms of impact, an estimated 156 projects have received PPP-Ecos support in the Cerrado scrubland, resulting in direct benefit

for 8,600 families distributed over an area of 146,000 hectares of land conserved through sustainable use by small rural producers. As for indigenous territories, more than 5,000,000 hectares receive PPP-Ecos support. The areas protected under the Program are home to 6 endangered species and 16 large vertebrates considered vulnerable. In addition to this, PPP-Ecos has also brought its influence to bear on 10 public policies on the national level and developed 10 new technologies with long-term effects.

PPP-Ecos is currently in a phase of reflection on all that it has produced in more than ten years of the Program, and now is a time to turn this experience towards the future. One conclusion is that all of the experiments it has backed have come good, or rather, none of the hypotheses raised concerning sustainable livelihoods can be discarded. The challenge now faced is to move beyond the pilot, the experimental, the local, into ampler solutions that, first and foremost, defend the Cerrado and seek forms of harmonious co-existence with it, while also generating regional and global environmental benefit.

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# Cultivating human capital for a sustainable society: the experience of a third sector organization, the IEB

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Maristela Bernardo, Maria José Gontijo, Henyo T. Barreto Filho, Manuel Amaral, Camila de Castro and the team at International Education Institute of Brazil

## Introduction

Even before the Convention on Biological Diversity (CBD) came into effect at the end of 1993 and its ratification by the Brazilian government in February 1994, third sector organizations in Brazil had already been promoting educational initiatives in various areas related to conservation, sustainable use and the fair and equitable distribution of benefits derived from the use of biodiversity. That is not to say, however, as Pádua & Valladares-Pádua remind us elsewhere in this book, that the Brazilian State has not done its part, especially in terms of promulgating the body of infra-constitutional legislation in keeping with the spirit of Art. 225, particularly that referring to environmental education and the insertion of the environment as a transversal theme within the National Curriculum Parameters.

Nonetheless, it became apparent early on that these initiatives would not be sufficient to meet the challenge presented by the CBD, especially in Articles 12 (Research and Training) and 13 (Public Awareness and Education), which, as a Contracting Party in the international arena, the country had formally committed to fulfilling in the mid 1990s. Indeed, establishing, maintaining and supporting tailor-made scientific and technical education and training programs to suit the necessities of developing countries with a view to identifying, conserving and sustainably using biological diversity and its

components, while also promoting and stimulating research towards such ends, is hardly a commitment upon which government action alone can deliver.

Thus the engagement of various non-governmental organizations (NGOs) in training and educating professionals from various fields predates and has no direct link to the CDB mandate. To return once again to the article by Pádua & Valladares-Pádua contained in this book, generally speaking, these educational and training initiatives were started by technicians from these organizations who had recognised gaps and identified themes considered important, but that were nevertheless underrepresented in the academic institutions. This path was taken mainly by NGOs whose scope of activity includes research. Added to this is the epistemological inertia characteristic of scientific disciplines on graduate and post-graduate courses, whose curricula are so rigid that it becomes extremely difficult to renew paradigms or even incorporate new material - which has led many teachers to develop educational and training programs outside the domain of Academia.

While some NGOs ran training initiatives for a period of time before stopping, others made education and training the crux of their operations. Amongst these institutions, not all of whom feature in this publication, are *Fundação Biodiversitas* (Biodiversitas Foundation), *Instituto de Pesquisa Ambiental da Amazônica* - Ipam (Amazonian Environmental Research Institute), *SOS Amazônia* (SOS Amazon), *Instituto de Estudos Socioambientais do Sul da Bahia* - IESB (Institute of Socioenvironmental Studies of Southern Bahia), *Sociedade de Pesquisa em Vida Silvestre e Educação Ambiental* - SPVS (Wildlife and Environmental Education Research Society), *Universidade Livre do Meio Ambiente* - Unilivre (Free University of the Environment), *SOS Mata Atlântica* (SOS Atlantic Forest), *IPÊ - Instituto de Pesquisas Ecológicas* (Ecological Research Institute) and *Fundação O Boticário de Proteção à Natureza* - FBPN (O Boticário Foundation for the Protection of Nature) - the latter from the business sector -, all of which either promote or have promoted, in parallel with their normal activities, educational and training initiatives in fields related to the

conservation of biodiversity, whether alone or in partnership with other NGOs and/or companies from the private sector. It is through undertakings like this that at least part of the demand for education and training left unfulfilled by the State can actually be met.

The *Instituto Internacional de Educação do Brasil* – IEB (International Education Institute of Brazil), founded before the CBD was drafted, took education and training, the provision of incentives for graduate-level education and the strengthening of articulation among social agents for sustainable development as its mission, acting as an agent for scholarship programs, promoting courses on themes judged to be important to a multi-sector public and incorporating training as the backbone of all of its programs.

### *Origins and Premises*

In 1989, the United States Agency for International Development (Usaid) and the State University of New York (Suny) launched an environmental scholarship program in Brazil: the Suny Brazil ADC Training Program. In 1997, with the adherence of WWF-US, this initiative gave rise to the Nature and Society Program, which became a benchmark among programs promoting the formation of human resources in the area of conservation, sustainable use and the fair and equitable sharing of the benefits derived from the use of biodiversity. The IEB was founded the following year (1998) as a non-profit civil association designed to give institutional form to this program in Brazil.

With the dissolution of the partnership with Suny in 2002, the IEB became a fully-fledged Brazilian non-governmental organization and broadened its range of activities in the areas of technical, scientific and academic support. From its origins, the IEB inherited an important accumulation of knowledge and experience in the formation of human capital directed towards environmental conservation and the construction of a sustainable society. This experience also showed that the pursuit of the organization's objectives would also necessarily require that it compete for resources, until then generated only by large international NGOs. In order to be able to face the challenge,



IEB invested day and night in institutional management and strengthening.

This second phase in the history of the IEB was consolidated upon the slow ripening of certain premises today wholly assimilated into the fabric of the institution:

- The primacy of an educational focus, understood in a broad sense, as the base of its mission to help promote the involvement of Brazilian society in the quest for sustainable development, the conservation of biodiversity and the reduction of poverty;
- The consequent specialization in actions to educate, produce and propagate knowledge with a view to integrating different perspectives on the issues handled within a single socioenvironmental conception configured by the convergence of social, environmental, economic, geopolitical and cultural approaches;
- Special emphasis on the theme of biodiversity on the environmental agenda, understood here as a continuum ranging from the preservation of particularly relevant sites to the search for economic alternatives in making sustainable use of natural resources;
- An increasing concentration of efforts in the regions of the Brazilian Amazon and the Cerrado grasslands as the natural result of the experience the institution has already accumulated in these areas and of its wish to continuously systematise its learning and perfect its pedagogical methods and approaches; something that would be jeopardised by the atomisation of interventions spread throughout national territory; and
- The valorisation of institutional strengthening, which starts from an awareness of the need for a framework of internal procedures and controls, so that, despite being a small organization, the IEB can instil respect in its bureaucratic, technical and political relations with the large institutions that operate in the field of international funding for civil society entities.

It is in this manner that the initiation of this new phase has been expressed in the regionalization of some programs, exemplified by

the consolidation of our offices in Belém, as part of our greater adherence to a territorial socioenvironmental approach, and in the refining of the connections between the content and approaches of the Institution's training/educational actions and its mission, which is to cultivate human capital for a sustainable society – as we shall explain in the sections that follow.

### *Programs, Courses and Scholarships*

Following these directives, the IEB runs multidisciplinary educational programs and courses for a multi-sector public that includes specialists, students, technicians from NGOs, public and private managers, researchers, community leaders and other agents and professionals involved in socioenvironmental projects and initiatives. The IEB courses and programs are vehicles for the dissemination of the ideal of socioenvironmental sustainability through actions that seek to rally various sectors of society to the process of formulating, accompanying and implementing environmental and social public policies for sustainable development.

Today, the IEB runs a set of programs, some of which are in their final stages, such as the Sustainable Business Program and the Climate Change Program, while others are currently being redefined, such as the Institutional and Sustainable Development Support Program, or re-converted, like the Community Forest Management Program, or have only recently been implemented, such as the Amazon Conservation Scholarship Program. In addition to these, the IEB spearheads the *Consórcio Aliança para as Florestas da Amazônia e Mata Atlântica* – Alfa (Amazon and Atlantic Forest Alliance Consortium), made up of seven organizations: *Instituto Floresta Tropical* – IFT (The Tropical Forest Institute); *Imaflora – Instituto de Manejo e Certificação Florestal e Agrícola* (Institute for Forest and Agricultural Management and Certification); *Instituto do Homem e Meio Ambiente da Amazônia* – Imazon (Amazon Institute of People and the Environment); *Instituto de Pesquisas Ecológicas* – IPÊ (Ecological Research Institute); *Grupo de Pesquisa e Extensão em Sistemas Agroflorestais*

*de Acre* – Pescare (Acre Research Group in the Extension of Agroforest Systems); and the University of Florida – UF. The objective of the Consortium is to conserve Brazilian tropical forests and increase the socioeconomic benefits derived from them.

In addition to these programs, the IEB also directly runs its own training programs, offering regular courses in areas it believes are underrepresented in Academia. The IEB has complete governance over some of these courses, for which it has contracted academic coordinators and teaching staff that rank amongst the most renowned specialists in the country in their respective fields. These courses are Environmental Law (now in its 6<sup>th</sup> edition), Environmental Policy (6<sup>th</sup> edition) and Participative Water Management (only 2 editions). Others are run in partnership with other NGOs, such as Economic Tools for Environmental Conservation (with Conservation Strategy Fund-CSF Brazil, now in its 10<sup>th</sup> edition) and Communication and the Environment (with WWF-Brazil, also now in its 10<sup>th</sup> edition). Given the expressive number of people who have benefited from the training provided, one can deduce that the regular offering of these courses has in some circumstances conferred greater visibility upon these themes, contributing towards their institutionalisation in regular teaching at formal educational establishments.

This agenda of regularly offered courses favours a multidisciplinary approach and a multi-sector public, that is, technicians and managers from NGOs and the public and private sector who are directly involved in projects and initiatives with a focus on the conservation of natural resources. Course registration is opened at various times throughout the year and the selection process is handled by an independent committee made up of representatives from our benefactors and partners and by socioenvironmental specialists. The students are selected on the basis of flexible criteria that consider academic background, professional experience and involvement in activities in community or civil society organizations, in government or in private initiatives. One important prerequisite is that the students be in a real position to apply and pass on the knowledge and skills they acquire on the courses.

In what follows we shall outline the programs run by the IEB, starting with those in their final stages.

The *Mudaclima* Program (Climate Change Program), which was administered from 2001 to 2005 with funding from the Dutch Embassy, was designed to broaden Brazilian society's knowledge and perception of issues related to climate change, encouraging the participation of various segments and sectors, particularly opinion formers, in public discussion. The backbone of this program was the annually held course entitled "Ecology and the Carbon Cycle", which, over the course of its 4 years on the curriculum, transmit knowledge on climate change to 96 professionals especially selected for their capacity to pass on that knowledge once acquired. The program also offered scholarships for the development of research on specific themes that resulted in theses, studies and publications, including the following three books: *The Legal Viability of the Clean Development Mechanism (CDM) in Brazil*; *Social Carbon: Aggregating Value to Sustainable Development*; and *Forest Carbon Stockpiling in Brazil: the Political, Socioeconomic and Ecological Dimensions*. Among the theses and studies, the following deserve special mention: the project on social carbon in Pontal de Paranapanema, in São Paulo; the creation of the Palmas Energy Efficiency Program; the creation of a database at the Ecological Institute containing the results of studies carried out on Ilha do Bananal; and another, currently in its closing stages, on urban environmental sustainability through natural roofing on ecological houses in the city of Rio de Janeiro.

The *Pronegócios* Program (Pro-Business Program), also funded by the Dutch Embassy during the period 2001/2005, was created to encourage the opening of private businesses with strong social and environmental components and to stimulate entrepreneurship based on ethics, social responsibility and environmental awareness as a means of generating income and jobs, thus promoting changes in attitudes and perception in the academic world and in the public and private sectors. Four editions of the course "Entrepreneurship in Business and Sustainable Development" were held periodically, educating 124 individuals in the development of an entrepreneurial profile

and the concept of sustainable development. The Program also awarded 22 scholarships to former course-takers to develop their business plans, some of which recently enjoyed considerable attention in the general media, such as Valentin Messias Degasperi's Ecobungs company, located in Pontal de Paranapanema, São Paulo, which produces and sells sustainable vegetal ecobungs. Consolidating the lessons learned so far, the book entitled *Plano de Negócios como Ferramenta para Viabilização do Desenvolvimento Sustentável* (The Business Plan as a Tool for Making Sustainable Development Possible) is scheduled for publication at the end of 2005.

Among the programs currently underway, Beca (Amazon Conservation Scholarships) is the result of the IEB's effort to convert the learning and achievements obtained through the Suny Brazil ADC Training and the Nature and Society Programs into a new scholarship program. With resources and support from the Gordon and Betty Moore Foundation's Andes/Amazon Initiative, Beca was formatted to award scholarships to professionals, technicians and students engaged in the conservation, sustainable use and sharing of benefits derived from the biodiversity of the Brazilian Amazon. The scholarships are intended for the academic improvement of high school, undergraduate and post-graduate students, researchers, community leaders and technicians from governmental, non-governmental and private organizations so that they can fine tune their professional performances and maximise the conservation of biodiversity and large-scale ecological processes on three strategic dimensions: the generation of scientific knowledge directly applicable in conservation; the creation and management of protected areas in the fullest sense of the term (including indigenous lands and those of other traditional communities); and the (re)definition of instruments of environmental policy/economy. In only its first year (2005) Beca awarded 92 scholarships across the three modalities, as shown in the chart below.

The programs currently undergoing conversion and redefinition, the Community Forest Management (PMFC) and Institutional and Sustainable Development Support Programs, are the ones that unfold on the local level and thus present the most impact *in loco*.

Support Modality			N° of scholarships awarded (2005)		Total
			1 <sup>ST</sup> round	2 <sup>ND</sup> round	
Professional Development			10	06	16
Small support	Secondary level		09	03	12
	Graduate		07	10	17
Post-graduation scholarships	Master	In Brazil	16	17	33
		Abroad	01	-	01
	Doctorate	In Brazil	03	07	10
		Abroad	03	-	03
Total			49	43	92

The PMFC, which is run out of the IEB offices in Belém, has a regional focus on the Amazon and was created in response to the demand for the articulation of the pilot programs in forest management that took part in the community forest management workshops held annually since 1998. One of the effects of the workshops was the formation of a working group – GT-MFC (Community Forest Management Working Group) –, made up of 22 institutions, including NGOs, representative and support groups for social movements, the government and the IEB secretariat. This group carries out strategic studies and interchanges and influences the formulation of public policies on the theme. In addition to its attempts to promote articulation among community forest management initiatives, the PMFC also conducts studies on the technical and tax aspects of community forest management and its potential in the Amazon region, on technical cooperation networks for access to markets for community forest products and on the socioeconomic impact of forestry certification (as part of the Alfa Program and with financial support from Usaid). The Program also works to promote egalitarian relations between the companies and communities active in the market (for which funding



has recently been approved by the French Environmental Fund) and identifies innovative mechanisms for agrarian regulation (financed by the European Union). The Program also involves training and interchanges for community leaders (with support from *ProManejo*), dealing with the technical, economic, social and cultural issues of forest handling.

The Padis Program, funded by the Dutch Embassy in Brazil, spent its 5 years of existence (2000-2005) supporting local partnership initiatives in 14 towns and cities, mostly in the Amazon and the Cerrado grasslands, with a view to strengthening social organizations, municipal governments and private initiatives in terms of their capacity for dialogue, articulation and joint action in search of solutions to socioenvironmental problems. The Program, which is currently concluding its knowledge systemisation work, was characterised by its emphasis on aspects considered fundamental to improving the quality of negotiations in the public sphere, such as the perfecting of democratic processes, the primacy of criteria of the common good in decision making, more universal access to information and a participative culture in the formulation of public policy. Based on the experience garnered during this period, the IEB now plans to redesign the format of the program by regionalising its actions. A serious dilemma faced thus far – as always – is the search for new sources of funding to maintain the program. According to our evaluations, the decision Padis took to invest in processes proved to have been the right one, though the program finds itself hedged in by the problem of having to rely on a single source of financial support and the general lack of financiers willing to take a chance on these processes.

### *Assessing the Impacts and Results*

The return on the IEB's work over the last 15 years, since its original partnership with Suny, can be at least partially inferred from the assessments and various glowing references it has received over this period, as illustrated by the following extracts from statements by scholarship holders who received various forms of support under



the Nature and Society Program between 1990 and 2004. This support included funding for long-term training and professional improvement scholarships. The long-term training packages were directed towards people who wanted to do specialization courses, master's degrees or doctorates either in Brazil or abroad, while the professional improvement scholarships involved short-term training for already established professionals at seminars, meetings, congresses, workshops, on practical courses, fieldwork and technical visits. The program also offered institutional scholarships, through which institutions received financial support for the promotion of training events for professionals in the environmental area. Many striking references from scholarship recipients throughout this period speak of how important this support was in their personal and professional development. We have included just a handful of comments below.

The Nature and Society Program represented a cornerstone in my professional formation, particularly in terms of practical specialization in the theme of protected areas. In addition to knowledge, it also offered me the chance to make contact with people from all over Latin America who now play crucial roles in the area of biodiversity conservation and with whom I still maintain close and extremely productive relationships. It also gave me the solid tools for success in the area of conservation and the professional development that have allowed me to feel that I "can make a difference" and my own contribution to implementing change.

*[Cristine Negrão; Associação de Pesquisa e Preservação de Ecossistemas Aquáticos/Aquasis].*

For a long time the IEB Nature and Society Program was one of the few alternatives available to the professionals of Brazilian NGOs and similar groups in terms of receiving high-level training in Brazil or abroad. The program was vital to me, mainly because it made it possible for me to take a post-graduation at Cornell, enabling me to unite the key points of environmental conservation with those of business. It was this synthesis of subjects that led to my being hired by

the World Bank, where I have now been working for three years as Private Sector Liaison for the PPG7.

*[André Guimarães; Instituto Bioatlântica].*

The big differential of the program is that it allowed for individual development while making it clear that the benefits have to extend to the society around us. I've tried to put this to work in my professional life, seeking to use the knowledge I acquired for the purpose of environmental monitoring and the rational use of natural resources.

*[Eder Comunello; Embrapa/Mato Grosso do Sul].*

The support of Suny Brazil was decisive in my professional performance as executive director of *Instituto de Estudos Sócio-Ambientais do Sul do Bahia* – IESB (Institute for Socioenvironmental Studies of Southern Bahia), now one of the most widely-respected NGOs in nature conservation in Brazil. Suny supported the IESB and various other colleagues. I believe that the Nature and Society Program left a lasting mark on the institutional development of the technical/scientific third sector in Brazil, supporting the formation of a network of researchers and activists in the environment and sustainable development that is nowadays very influential within the official Brazilian agenda and the media in general. I believe the continuation of this program is fundamental to the consolidation and improvement of this experience in democratisation, with special emphasis on quality for Brazilian society and on the most vulnerable regions of the country, such as the North and Northeast.

*[Rui Rocha; Instituto Floresta Viva]*

The career paths of those who benefited from the Suny Brazil and Nature and Society Programs reveal an expressive individual and collective impact in which the Program's contribution is clearly recognised. This contribution has resulted in a considerable number of publications on environmental conservation themes, in the production of training materials, the holding of events, collaboration in the formation of networks, in social mobilization activities and a direct multiplying effect, not to mention in the professional formation of

those trained under the scholarship program, both formally and informally. Of those who received training under the program, 89.4% used their knowledge on other training programs, thus becoming multipliers of the information acquired.

Another impact of the program is the support it gave to some 65 other Brazilian institutions – NGOs, academic institutions, research institutes, networks, municipal and state governments and community and social movements – through its sponsorship of training programs, conferences, various meetings, publications and research projects. The institutions and individuals who have received this support constitute an informal network of multipliers, as can be seen from the words of this representative from the Pro-Indian Commission of São Paulo.

*Quilombos* (former slave colonies) and indigenous peoples were the target public for the training the Pro-Indian Commission of São Paulo developed with the support of the IEB. The goal of the various forms of training administered was to expand the knowledge of the men and women of these communities as to the importance of preserving the environment and biodiversity and of sustainable development and the role of each individual in this challenge. The training was articulated with the income generation initiatives we run with this public in order to reinforce the importance of environmental sustainability in any economic endeavour these populations might undertake.

With a track record that includes 103 institutional projects, support for 55 institutions, 5,847 individuals trained and 42 theses produced, Suny Brazil and Nature and Society made an important contribution to the formation of an entire generation of environmentalists. This legacy, a cornerstone in the history of the IEB, is incorporated within the institution's practices and demonstrates the powerful multiplying effect of training and education, with ramifications that go well beyond the expected immediate results. These benefits have continued to accumulate over time and show themselves to be even more effective when those who received the

training assume strategic positions from which they can exercise an influence in the definition and implementation of public policies, in the use of natural resources, in the formation of research agendas and in the generation of synergies among various agents.

One of the high points in the history of the IEB is having represented such an important option in professional training for students doing specializations, master degrees or doctorates in Brazil and abroad; for the technicians, managers and community leaders who broadened their knowledge bases through short-term and practical training; for the researchers on field work and technical visits; and the managers and members of institutions who became multipliers for this knowledge through training initiatives of their own. This experience has furnished us with a body of varied and practical knowledge in all respects unlike anything previously seen in the administration of research and training scholarships for the professional qualification of human resources in the environmental area in Brazil. This vocation finds itself reaffirmed today in the Beca Program, which aims to promote, from high school-level up, the qualification and formation of professionals in various fields related to the conservation of biodiversity. Scheduled to extend over a period of at least five years, we hope that Beca can fulfil a similar role to that executed by the previous IEB programs, contributing to the formation of a whole new generation of technicians, professionals, militants and activists in the environmental area, especially those most directly associated with the conservation of biodiversity.

The regular courses offered by the IEB were also assessed in terms of impact. For example, the Communication and Environment course, now in its 10th edition, was monitored through a two-stage questionnaire sent out to 162 people who took the course up to the year 2004, 49 of whom responded in full. According to the data analysed from this sample, the participants trained 1,610 people formally and 1,670 informally, and obtained expressive results in the following categories: the number of articles and reports published or broadcast in magazines, newspapers, on radio, sites and TV; interviews given to professionals in the various media formats; materials developed, including press

releases, information leaflets, electronic bulletins, folders, primers, CD-ROMs, posters and institutional newsletters; publications, such as articles, books and theses; the coordination and organization of events to disseminate the knowledge acquired on the course; and institutional communication plans executed.

In an individual impact assessment carried out with 35% of the participants on the top-up course in Environmental Law, scholarship recipients informed that they had trained an approximate total of 1,773 people formally and some 2,610 informally. All of those surveyed affirmed that the course had been of great importance to their personal development, enabling them to obtain a more secure and efficient performance and affording a broader vision of environmental law. Others went so far as to say that the course served to dynamize their effectiveness in the environmental sphere, as in the execution of such tasks as inspections, licensing and environmental education.

Padis had an extremely relevant impact on the life of the institution and on all those who, in some way or other, were strengthened by the projects it supported. It was a program with a wide scope, not only in terms of geographical reach, but also for its conception, which included aspects of institutional and organizational development, and because it was willing to tackle the complex variables involved in the dynamic of the public spaces in which socioenvironmental issues are resolved. These characteristics made it a mirror in which the IEB could see itself reflected and re-evaluate its planning, management practices, level of internal integration, the adequacy between its institutional size and its actions and, on the strength of that, reaffirm its mission upon new bases.

Many lessons were learned from Padis. With its decisive adherence to a socioenvironmental territorial approach, the program went some way towards consolidating and enriching the IEB's environmental commitment. In fact, that orientation was already implicit in the institution's set of programs and activities, though it needed to ripen within the team and be formulated as a conceptual direction expressed in its various mechanisms, forums and instruments. Something else that became clear to the institution through Padis was the importance

of working with processes that involve environmental conservation – and of including them in its pedagogy –, rather than simply focusing on impact indicators. In alliance with this, it also helped to establish a focus on the local level as the preferred target for the Institution's educational and training initiatives, even in niches of intersection with themes on the national or global agenda. An example of this was the course promoted by our Belém office entitled “Understanding our Reserve and Planning our Production”, which was directed towards 25 community leaders from Nossa Senhora do Perpétuo Socorro and Pedreira (on the Arimum River), São João de Cupari and Juçara, located in the Verde Para Sempre (Green Forever) Extractivist Reserve – the largest of its kind, with some 1.3 million hectares –, in the municipality of Porto de Moz in Pará State, the site of intense agrarian and socioenvironmental conflicts surrounding the BR-163 interstate highway.

Padis also showed that an institution that dedicates itself to education, the promotion of professional qualification, support for research, training and the dissemination of knowledge on sustainable development needs to build the link between the content of this training and its final objective – the formation of human capital – with increasingly more refined steps. To achieve this it is also necessary to bridge the gap between the support given to each individual or institution and the program's conformity to its role in the creation of a collective synergy capable of generating, in practice, new parameters and paradigms that will result in a sustainable society in the long term.

## Conclusion

The result of all of this is that, today, the IEB has a consolidated understanding that the socioenvironmental investment model based on training and educating people and strengthening organizations remains vital as an irreplaceable tool for dealing with the collective agenda of biodiversity conservation and sustainable development on their various levels of technical and institutional necessity. This investment acquires a new sense and greater amplitude when seen as part



of the qualification of the public sphere, that is, of the set of forums, instruments, mechanisms and postures that make up the operation of public interest. It is thus about deepening and perfecting investment in individual training and education so that its connection to the collective dimension remains permanently explicit.

The assessments carried out on the various programs the IEB has developed indicate, from various angles, the need to renew the country's local development agenda. The Institution aims to contribute to this renewal, above all, by bringing its experiences and reflections, and those of its partners, to the public through heavy investment in the propagation of knowledge through publications that not only deal with the technical issues of biodiversity conservation, but also with the institutional, cultural and political aspects inherent in the idea of sustainable development.

An example of this is the importance the Institution's programs and courses place on the proper functioning of democratic public forums as a source of the political sustainability indispensable to the search for a development model that can bring social equity and environmental balance. This has been the background for all of our actions over the recent decades, from the local to the global; actions that are emblematic examples of the two main documents approved at Rio-92: the Convention on Biological Diversity and Agenda 21.

Another theme that emerged from Rio-92 and which has, from many points of view, stamped its presence upon discussions on sustainable development ever since, is the need for institutional and financial stability, from the governmental level to that of civil society organizations. The IEB has come up against these issues repeatedly along the course of its development as a small part of this universe, in which social organizations have collectively played an important role in tune with the concepts and propositions expressed in the various international documents that have emanated from the UN on the responsibilities of governmental and non-governmental agents in the hoped-for transition towards economic, social and environmental sustainability. We feel that these issues, when expressed in terms of the difficulties the smaller agents have in dealing with them, say a



lot about the larger scale difficulties that have for decades darkened the horizon of sustainable development in the large global theatres.

This is because, when those documents speak about work on the local level – especially that which associates the conservation of biodiversity with the promotion of quality of life for poor groups – what they are referring to, in practice, is the microscopic and synergetic action of countless entities that have managed to go where the governments cannot reach and do what governments cannot do with commensurable agility and flexibility. To some degree, those entities serve them. However, as they are more fragile, they suffer more directly from the erratic course of international negotiations and the insufficient advances regarding the financing of sustainable development, its logic and its continuity. Likewise, when those documents speak of the lack of research and the need to generate more knowledge on the multiple aspects inherent in the search for sustainable development, although they focus on the more conventional approach of dialogue with Academia, what they are really referring to is the enormous effort that has been made in this direction by non-governmental organizations, either alone or in partnership with academic research or teaching institutions.

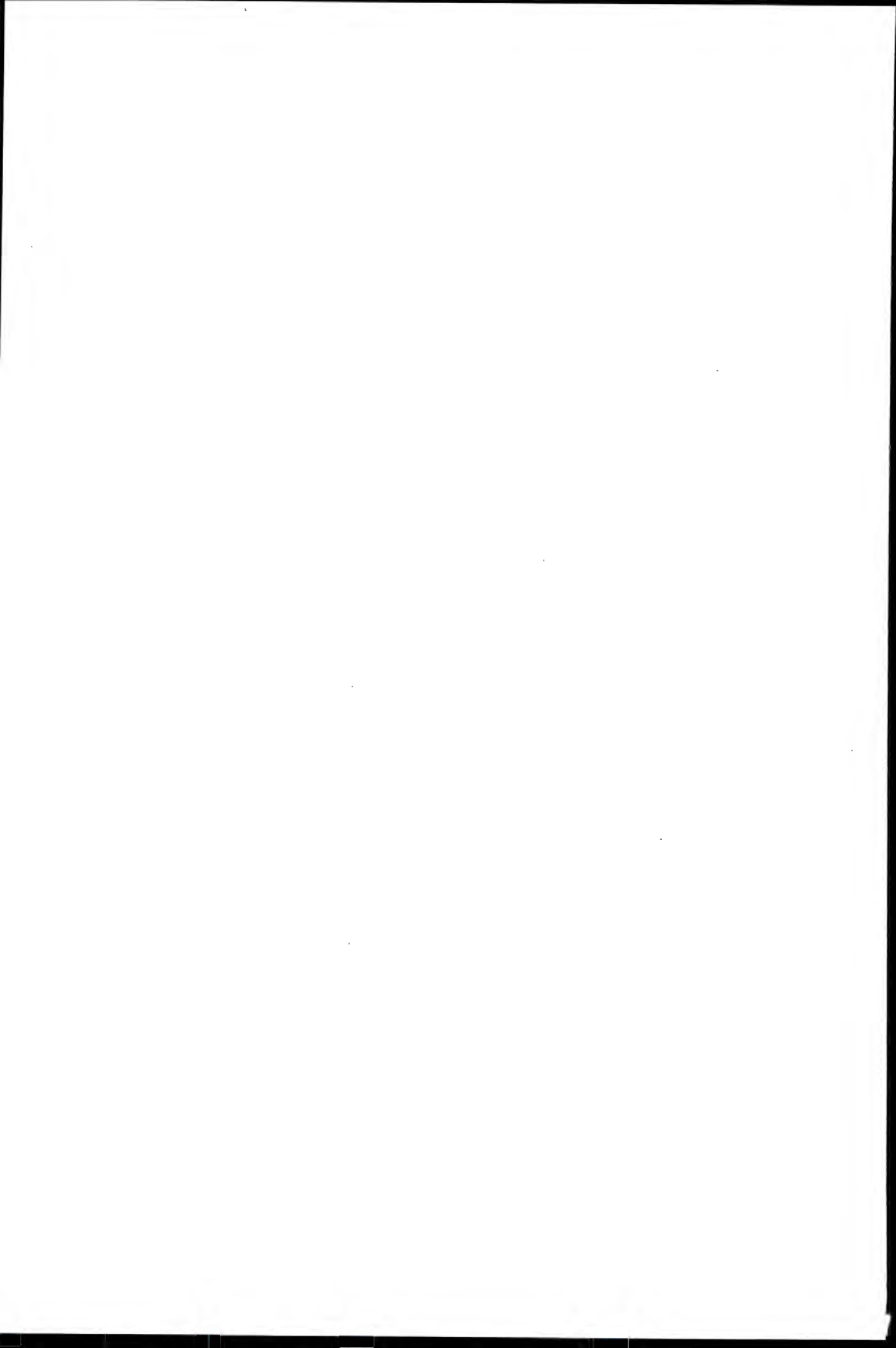
The Implementation Plan for the Sustainable Development World Summit, fruit of the encounter held in Johannesburg in 2002, reiterates the commitment of the UN member states to the principles approved at Rio-92 in pursuit of sustainable development, to the targets set by Agenda 21 and to the main international agreements signed since then. Once again, recognition was made of the importance of biodiversity's decisive role in sustainable development and the eradication of poverty, its indispensability to the planet, to human wellbeing and the cultural integrity of the population. Also reaffirmed was the recognition that the challenge we face demands new and additional financial and technical resources for developing countries and the implementation of actions on all levels, including the community level – in other words, action directly at the source. To achieve this, the importance of education and training programs, the production of knowledge, institutional advances and the encouraged participation

of civil society was once more underlined. Finally, but certainly not for the last time, the Plan affirmed that all this depended on “a substantially greater” effort on behalf of the international community in accordance with the possibilities of each of its members.

Fifteen years after Rio-92 and three after Johannesburg, however, this core knot – the poor performance in the creation of effective conditions – continues to jam the decisions taken and the commitments assumed. This is perhaps the root of the considerable ambiguity and discontinuity even among cooperation initiatives that, in principle, do not depend on the UN-centred global negotiations. The resources made available by institutions and governments from wealthy nations in recent decades are marked by an intense volatility that could certainly be reduced if more clearly referenced by the targets assumed at the successive Conferences and other deliberations on sustainable development.

In Brazil, that volatility deflates initiatives that build frameworks, but do not have the support to follow them through. The funding comes and goes, redirected on the basis of strategic decisions at the source. If this does not make that funding any less important, it does prevent it from being considered part of a mainstream capable of truly fulfilling, in the medium and long term, what so many global documents have been (re)affirming for decades: the mega-operation to effect the transformations needed to bring about the sustainability of the planet and a true change of level for civilization.

Returning to the front line, where we find ourselves here, the consequences are palpable, concrete and constant: vulnerable institutions, discontinued actions, the loss of investments in teams, methodologies and partnerships. Nothing is guaranteed. What you want to do and what you can do is clearly defined, but there lingers a great deal of uncertainty as to who will pick up the bill. For endogenous reasons, this situation is aggravated in Brazil by the lack of an internal culture (governmental and private) that could allow for the mobilization of sufficient resources to be able to ensure the continuity of this myriad of interventions, despite the planetary concerns.



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# The lack of formal educational options in the conservation of biodiversity in Brazil

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And the growing opportunities created by third sector institutions to fill this gap: a case study – Instituto de Pesquisas Ecológicas (IPÊ)

Suzana Machado Pádua  
Claudio Valladares Pádua

## Introduction

Academic training in the conservation of biodiversity is a deficient field in Brazil, despite the biological riches found on national territory. Little attention has been paid to the preparation of professionals equipped to truly value nature and this lack has certainly contributed to acts of disrespect and aggression towards the environment throughout the country.

Home to 20% of the world's freshwater and 30% of the tropical rainforest left on the planet, Brazil has a natural heritage generally considered mega diverse. However, in the absence of an educational system capable of generating an awareness of its importance, this value is not largely recognised. Education has the power to help direct the attention of decision makers and society in general to the value of Brazilian nature and of the traditional communities that live in harmony with the natural world, so they may be prioritised when it comes to plotting the course of future action. However, this is not what happens, and our socioenvironmental problems continue to multiply and reveal an increasingly more striking unbalance.

There are many factors that have a bearing on environmental protection and thus deserve special care. Professional training could help guarantee greater sustainability for natural riches. For example, towns and cities have enormous impact on their rural surroundings,

particularly because of the strain they put on natural resources. This is one important reason why comprehensive environmental education should be adopted in urban centres, home to 70% of the Brazilian population. Most of the decisions that affect natural areas are taken in cities and are uninformed by a true awareness or full understanding of the whole picture, which is why they are not always the right ones. Urbanites do not see the real impact of the prevailing model of development, based as it is on mass consumption and production and dependent on the extraction of natural resources. Without due awareness of the complexity of this impact and of the impossibility of replacing natural resources that are exploited unsustainably, this model continues and accelerates. The end result is that forests are cut down and natural areas are depleted without concern for adopting measures that minimise the repercussion of such loss.

In Brazil, as in other countries, the pressure upon natural areas has become a cause for concern and has led to the creation of Conservation Units (CUs) in a bid to guarantee the long-term protection of the ecosystems. Faced with a lack of awareness of their importance, these locations find themselves the target of continuous challenges and mounting pressures. As they are not the priority of either the public or the decision makers, the funding allocated to CUs for infrastructure, which has to be adequate if the professionals are to work efficiently, and for vigilance, which has to be continuous and constant, is always insufficient. The result is a bankrupt and inefficient system that suffers often irreparable losses.

Without adequate infrastructure and specialised personnel, the protection of the country's natural riches will depend on a change of values and attitude in relation to environmental protection and the sustainable use of natural resources. This ought to be the basis of a new education offered to each Brazilian citizen. With a more effective education at all levels of schooling, one that included conservation and the valorisation of nature, many of the aggressions against the environment observed each year would certainly be more easily avoided.

Unfortunately, all too few teaching institutions feature conservation as a prevalent theme on their curricula. This trend can be

observed from primary schools up, despite the Ministry of Education's proposal that the environment be inserted within teaching curriculum parameters as a transversal concept. There was a concerted effort in the past to train teachers on a national level, but the initiative was discontinued with the change of government and the support materials disappeared.

At undergraduate and even post-graduate level, the examples are likewise scarce. While there are courses in Forestry Engineering, Biology and Ecology and other related areas, degrees specifically in conservation are still few and far between (Valladares Padua, oral presentation delivered in Gainesville, Florida, 2002). For a country of such continental proportions as Brazil and with the megadiversity it contains, this educational lacuna ends up reflecting across all of the sectors connected to conservation and sustainable development.

The *Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis* – Ibama (Brazilian Institute for the Environment and Renewable Natural Resources), a government organ, offers annual courses in environmental education, both for its staff and for the external public. However, despite the quality of this initiative, it is still insufficient to meet national needs. Another attempt by Ibama was the creation of the Mobile School Project designed to attend the CUs. Unfortunately, this program is no longer available.

Given this situation, it is becoming increasingly more frequent to see third sector organizations assuming the task of providing education and training for diverse publics in various areas in a bid to plug the gaps, producing courses on themes identified as important, but which lack proper educational attention. This trend can be perceived in various parts of the country.

The aim of this article is to offer a brief overview of the situation of environmental education in Brazil, a matter whose ample treatment in Brazilian law is proof that, at least formally, it is considered an important issue. We have also included extracts from documents that have particular influence in the area, such as those drafted during the Rio-92 Summit, particularly the 'Convention on Biological Diversity'.

Finally, the article will focus on a case study: IPÊ – *Instituto de Pesquisas Ecológicas* (Ecological Research Institute), a non-profit organization dedicated to the formation of conservationists in various fields of work.

The idea is to show how training and education are essential factors if conservation is to become a reality and how the lack of courses available in formal teaching institutions has led some organizations to take the responsibility for this sector upon themselves.

### Environmental education as a theme in Brazilian public policy

Environmental education began to receive attention in Brazil in 1981, when it was included as an important principle in National Environmental Policy through Law nº 6.938, as can be seen from Article 2, item X:

- Environmental education [is to be provided] at all levels of schooling, including community education, with a view to preparing that community for the active defence of the environment.

Decree 88,351/83, which regulates this law, establishes that it is incumbent upon all spheres of public power to:

... orient education, at all levels, towards the effective participation of the citizen and the community in the defence of the environment, taking due care that school curricula in the various compulsory subjects shall complement the study of ecology.

Article 225, item VI of the Federal Constitution of 1988 recognises society's individual and collective responsibility in the implementation and practice of environmental education, declaring:



It is the duty of Public Authority to promote environmental education at all levels of schooling and to promote public awareness for the preservation of the environment.

Environmental education received special attention both nationally and internationally at the Rio-92 Summit. The main document signed by the participating nations, known as Agenda 21, defines the base of actions governments should adopt in their national public policies. Chapter 36, entitled "Promoting Education, Public Awareness and Training", proposes the reorientation of teaching to include the notions of sustainability and sustainable development, with emphasis on the importance of permanent environmental education focused on local problems (Czapski, 1998).

In Brazil, Agenda 21 has been an important reference in legitimising educational actions connected with environmental management, whether within specific institutions such as schools, or in local and regional community contexts. The document has been taken as a base in the formulation of public policy on regional and national levels and in the development of human, scientific, technological and organizational resources, promoting partnerships between organized civil society and various instances of public authority in areas related to socioenvironmental issues (Pádua, 2004).

Another document drafted at Rio-92 by educators, representatives from civil society organizations and other interested parties is the "Treaty on Environmental Education for Sustainable Societies and Global Responsibility". As one of its principles, the treaty establishes that "the base of environmental education should be critical and innovative thinking, anywhere and at any time, in its formal, non-formal and informal ways, promoting the transformation and construction of society" (WWF/Ecopress, 2000:22). It also recognises that "environmental education must help develop an ethical awareness of all forms of life with which humans share this planet, respect all life cycles and impose limits on human exploitation of other forms of life" (WWF/Ecopress, 2000:24).

Two other documents were also drawn up at Rio-92: the Framework Convention on Climate Change and the Convention on Biological

Diversity. Article 13 of the latter establishes that public education and awareness should:

- (a) Promote and encourage understanding of the importance of, and the measures required for, the conservation of biological diversity, as well as its propagation through media, and the inclusion of these topics in educational programmes; and
- (b) Cooperate, as appropriate, with other States and international organizations in developing educational and public awareness programmes, with respect to conservation and sustainable use of biological diversity.

It is interesting to note that while education in general has never received due attention from the Brazilian State, the environmental area has been paving the way for achievements in this field too. The importance of environmental education has made itself felt in national public policy.

Law nº 9,795/99, sanctioned by the President of the Republic on April 27, 1999, officially recognises environmental education as an essential and permanent part of the country's educational process as a whole, whether formal or non formal. As the result of almost five years of debate and discussion, this law represents the demands of various segments of society and constitutes an important advance insofar as it consolidates an ample understanding of environmental education upon its basic principles (Pádua, 2004).

Article 1 of the National Environmental Education Policy defines environmental education and includes society's socio-political concerns in dealing with the environment when it affirms that:

By environmental education we understand processes through which the individual and the collective construct social values, knowledge, abilities, attitudes and competencies directed towards the conservation of the environment, an asset of common use to all peoples and essential to healthy quality of life and its sustainability.

Adding in Article 2 that:

Environmental education is an essential and permanent component of national education, which must be present in an articulate manner at all levels and modalities of the educational process, whether formally or non formally.

Particularly by adopting a wider focus, as in Article 4, the Policy defines the principles of environmental education under the following aspects and adjectives: a humanist focus, holistic, democratic and participative; as a conception of the environment in its totality, considering the interdependence between the natural, the socio-economic and the cultural, under the focus of sustainability; as a pluralism of ideas and pedagogical concepts, from inter-, multi- and transdisciplinary perspectives; a connection between ethics, education, work and social practices; as guaranteeing the continuity and permanence of the educational process; a constant critical assessment of the educational process; an articulated approach to local, regional, national and global environmental issues; and recognition and respect for individual and cultural plurality and diversity.

Despite its striking and innovative presence in Brazilian legislation, environmental education is still incipient in all educational environments. Initiatives that could be cited as model examples are scarce and generally developed by individuals or small groups who have opted to include the theme on their curricula of their own accord, rather than as a result of anything outlined in law. Of course, the law does help, insofar as it lends support to such initiatives, but it does not guarantee their implementation, especially when there is a shortage of suitably equipped teachers and multipliers who could develop programs that take the environment and the conservation of biodiversity as their main themes.

## The role of third sector organizations and the business sector in the field of educational training in the conservation of biodiversity

Seeing that the State has been unable to fill the demand for educational training in the field of biodiversity conservation, third sector organizations, especially research-based organizations, have assumed responsibility for the area. The same could be said for some companies that have taken it upon themselves to run educational programs on conservation in parallel with their regular operations or in partnership with third sector organizations.

In general, the training is administered by professionals from these institutions who have identified themes they consider important, but for which there are no formal courses. Many non-governmental organizations (NGOs) have been working to prepare professionals so they can better fulfil their conservationist roles. Some have launched specific courses that were later discontinued, while others have made these activities part of their functional base. For example, *Biodiversitas*, in partnership with other organizations, undertook the training of park wardens and professionals from Conservation Units and produced courses that are now widely recognised for their quality. For many years, *Instituto de Pesquisa Ambiental da Amazônica* – Ipam (Amazonian Environmental Research Institute) offered theoretical/practical courses to conservation leaders.

Other NGOs prefer to take the communities in the regions in which they operate as the public to be trained and educated. *SOS Amazônia's* work with the communities of Serra do Divisor in the state of Acre is a case in point. In the Atlantic Forest, the *Instituto de Estudos Socioambientais do Sul da Bahia* – Iesb (Institute of Socio-environmental Studies of Southern Bahia) has assumed a similar role. Iesb works towards instilling awareness of the value of the local nature by seeking sustainable development through alternatives for supplementary income. Another example is the *Sociedade de Pesquisa em Vida Selvagem e Educação Ambiental* – SPVS (Wildlife and

Environmental Education Research Society), which provides training in conservation practices to the population of the Guaraqueçaba region. Also in Paraná, the *Universidade Livre do Meio Ambiente* – Unilivre (Free University of the Environment) deserves special mention. In addition to supplementing the need for training and education on environmental themes, the establishment of the university is a good example of innovation, as it was set up in an environment heavily degraded by mining, which it managed to restore and transform into a place of stunning scenic beauty.

As a response to the growing demand of people interested in becoming involved with socioenvironmental causes, SOS Atlantic Forest has been providing courses in environmental voluntary work. The *Instituto Internacional de Educação do Brasil* – IEB (International Education Institute of Brazil) takes education in conservation as its base, providing scholarships on various programs to individuals from all over the country, though particularly from the Amazon region, and promoting courses on areas it judges to be important, such as journalism and communication, environmental legislation and socioenvironmental entrepreneurship, among others. IPÊ – *Instituto de Pesquisas Ecológicas* (Ecological Research Institute), which we will speak of in more detail in the next section, works with the communities of Pontal do Paranapanema and Nazaré Paulista in São Paulo and Superagüi in Paraná with the main goal of ‘empowering’ these people in the exercise of citizenship. By attending the participative meetings, called ‘Eco-Negotiations’, and adopting sustainable development practices, people gradually become aware of their importance and transformative role in bringing about human improvements and other benefits that come of conservation (Pádua, 2004).

In the business sector, two particular examples are worthy of mention. The first is the *Fundação O Boticário de Proteção à Natureza* (O Boticário Foundation for the Protection of Nature), which set up the Salto Morato campus in Guaraqueçaba, Paraná. The campus is directed to research and training and education through short courses in various areas related to conservation and Conservation Units. The second is a partnership between Natura and IPÊ for the development

of a *strictu sensu* post-graduation in the conservation of biodiversity and sustainable development. A campus is under construction in Nazaré Paulista, São Paulo, where the students will be able to enjoy a learning experience that mixes theory and practice.

### Case Study: IPÊ – Instituto de Pesquisas Ecológicas (Ecological Research Institute)

Since it began its activities in the conservation of biodiversity, IPÊ has had interns and students working on its field studies. Many of these remained with the group after graduating, working on projects of their own, though integrated with the conservation of the region in which they had conducted their studies. This was how the Institute itself came to be formed in 1992, by a half dozen professionals in the areas of biology, forestry engineering, ecology and environmental education.

IPÊ started out in Pontal do Paranapanema, São Paulo, considered the second most underprivileged region in the state. Endangered species studies did not seem to be enough to make the conservation run efficiently, as the aggressions against the environment were a constant. Thus environmental education became one of the bases of the Institution's work, seeking to involve the local community and instil a sense of pride in living in a region that is home to the last surviving remnants of Atlantic Forest in the São Paulo countryside, and with such high levels of biodiversity.

The IPÊ team itself underwent training in the most varied modalities, as the Institute has always encouraged study and self-development. Some team members graduated and sought out post-graduations at renowned national and foreign universities, thus strengthening the team, which is today made up of 5 doctors, 6 doctoral students, 7 masters and 5 master degree students.

In the mid 90s it became clear that training/education and opportunities to mix theory and practice were fundamental if the conservation of biodiversity was to actually occur. It was based on this understanding

that efforts were made to construct the *Centro Brasileiro de Biologia da Conservação* – CBBC (Brazilian Centre for Conservation Biology), where short courses are administered on themes considered important, but underrepresented at formal teaching institutions. The student public that attends these courses is equally diverse, as the demand for socioenvironmental themes seems to be reaching an ever-increasing number of social segments. CBBC students include university students, educators, government employees, people from the private and business sectors and from non-governmental organizations.

Since its inauguration the CBBC has taught 1,200 students on the following courses and topics:

- Course on Latin American Conservation Biology and Wildlife Management (in partnership with the Smithsonian Institution, USA);
- Quantitative Ecology;
- Remote Sensing;
- Medicine in Conservation (in partnership with the Wildlife Trust Alliance, USA);
- Environmental Education;
- Community-based Ecotourism;
- Geographic Information System.

The Course on Latin American Conservation Biology and Wildlife Management, for example, has become a benchmark within the Institution, as it attracts students from various countries in addition to the Brazilian contingent. The demand demonstrates the importance of the course as a complement to academic education. The number of candidates always exceeds the number of available places, which are often reserved well in advance.

A word from a former student might explain why:

“University enriched my theoretical knowledge... but I feel a lack of a more specific, practical learning to back it up...of an education that would enable me to link this theoretical knowledge with practice in the field of conservation biology.”



The courses also encompass themes related to sustainable development for the local communities, such as a range of arts and crafts and regional cooking, among others. These are particularly important for community-based ecotourism, which needs local people who are equipped to do quality work that generates profit but does not have a negative impact on the environment.

The teachers on CBBC courses come from various places, including professionals from IPÊ, who share their expertise with the students. This has been one of the attractions of the courses, as the students know they will have the opportunity to experience theoretical content put into practice.

CBBC course-takers come from various regions of Brazil and from other countries in Latin America. The Centre also hosts a biannual course for students from Columbia University in the USA, which gives the CBBC the chance to show students from abroad how conservation is handled in Brazil and the challenges it faces, thus giving them a fuller vision of the complexity of the socio-environmental theme.

Little by little IPÊ is being recognised as an educational institute and external organizations have started requesting specific courses to be offered in various different regions. For example, the team has been running courses in conjunction with WWF-Brazil in Brazilian Amazonian states, mainly for Conservation Unit managers. Formal evaluation processes have made it possible to improve these courses and the idea is to continue taking them to regions that lack such opportunities.

As mentioned before, IPÊ matured to such a point through this experience that it took the bold step of developing a Master's degree course in conjunction with Natura. This process has been structured step by step, though with growing certainty of the importance of preparing well-qualified people capable of furthering the cause of biodiversity conservation and sustainability.

## Final considerations

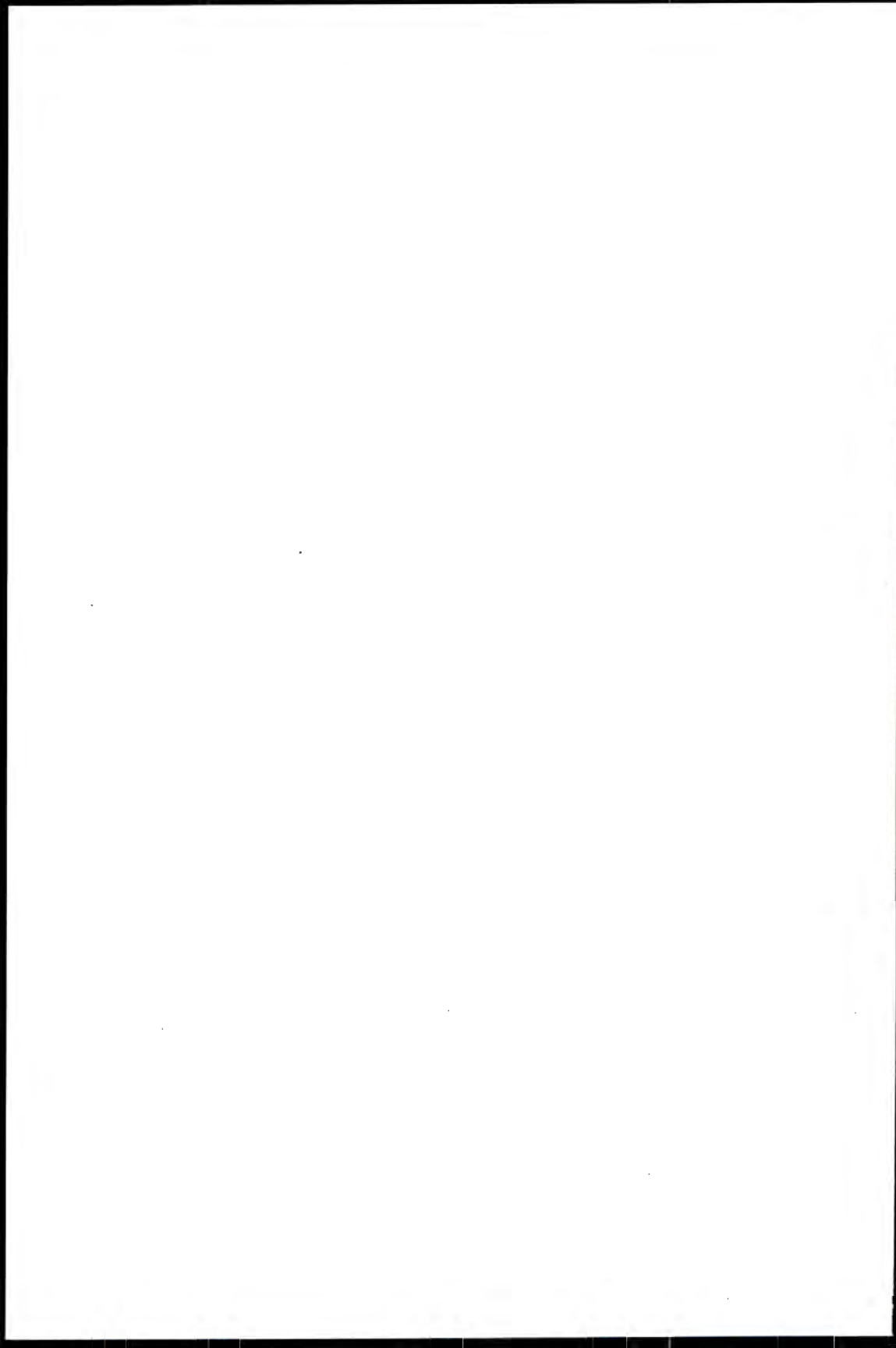
Educational institutions are facing a great many challenges in trying to adjust their curricula to incorporate a focus on biodiversity conservation. They have to deal with the common limitations concerning the hiring or firing of teaching staff, which make it difficult to include courses that can really address the programmed content. Even programs that teach on themes related to conservation tend to prioritise theory, which makes it difficult for the students to put the ideas into practice. In academic education, what predominates is theoretical content that is not always adjusted to the changes in scenario or to the necessities that arise over time.

On the public level, government-run training/educational opportunities are all too frequently discontinued. Courses appear and disappear with each change of mandate on the whim of the incumbents. This has long been a reality in Brazil and is perceptible in many fields, whether related to education or not.

Against this challenging backdrop, third sector organizations have been channelling more and more effort into filling the gaps in the educational fields related to conservation and sustainability. In setting their long-term goals, they have seen with greater clarity where they need to direct their efforts in order to increase the effectiveness of their actions. This movement has helped identify the areas in which there is a lack of suitably qualified professionals; gaps that are worthy of whatever effort is required to fill them up.

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# Who finances the work of environmental NGOs in Brazil?

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The results of an opinion survey that gives a breakdown of the present and the future of an integrating action on the part of Brazilian society

Ana Cristina Barros

## Introduction

The corporate sector controls ample financial capital for action and the political capital for decision on a grand scale, with the capacity to lend tremendous power to the work of socioenvironmental organizations in Brazil. Project funding has been the central theme on this agenda, whether through the project edicts released by companies or the bilateral agreements between companies and non-governmental organizations (NGOs). In this context, the notion of how incipient this relationship is lies side-by-side with its risks and the criticism lodged against it. Based on an opinion survey conducted in Brazil by The Nature Conservancy, this article aims to offer a snapshot of what the main social groups involved with the environmental issue in Brazil think about the sources of funding for NGOs in the country. It also focuses on and the future prospects for the relationship between these two sets of players in terms of progressing towards the fulfilment of the national commitments to international treaties that, first and foremost, respond to the aspirations of the Brazilian government and society towards a model of development that reconciles economic growth, the conservation of biodiversity and of the environmental services and social equity.

Strengthening relations between NGOs and companies requires shifting the challenges of a productive dialogue away from the podium,

establishing mutual trust and setting shared agendas. This article takes funding as its focus on the basis of an understanding that, in addition to enabling concrete advances, it is also a way to begin a political relationship between the two. A relationship of financial patronage involves mutual recognition between the parties and discussions on the projects and their results, thus broadening the possibilities for consolidating deeper trust and collaboration. This encompasses everything from the joint development of technologies for public and large-scale use, methodologies and client networks and partnerships to more refined discussions on actions that augment the efficiency of environmental management in the governmental sphere. At the highest point, besides operational changes in the companies themselves, we also need enlightened executives who can serve as ambassadors for the cause by working their contact networks at the highest level.

## The opinion survey

During the period from October 2004 to June 2005, interviews in the form of a structured questionnaire on sources of funding for environmental NGOs in Brazil were conducted with 838 people from the following social groups: parliamentarians (councillors and senators), NGOs (environmental and socioenvironmental), companies, foundations and executive government. The interviews took place at three large national meetings: The 4th Brazilian Congress of Conservation Units (CBUC), held in October 2004, the World Social Forum, which took place in January 2005, and the Ibero-American Congress on Sustainable Development (*Sustentável 2005*), promoted by the Brazilian Corporate Sustainable Development Council (CBEDS), held in June 2005. We complemented the sample taken at these congresses by hiring the services of specialists in opinion surveys to apply the questionnaire at the National Congress, Ministries and other executive organs in Brasília. The survey was carried out directly with parliamentarians and holders of directorial and managerial positions at the Ministries of the Environment; Agriculture, Cattle-farming

and Supply; Regional Integration; and Transport, as well as at the Brazilian Institute for the Environment and Renewable Natural Resources (Ibama) and at the National Water Agency (ANA) (Table 1)<sup>65</sup>.

**Table 1 – The public surveyed, classified by social group and data collection strategy**

		Gov	NGOs	Company	Parlamentarians	Universities	Other	Total
CBUC	Oct/04	112	75	31		211	23	452
WSF	Jan/05	7	27	2		12	3	51
Sustentável	Jun/05	19	18	37		40	18	132
Interviews	May/Jun/05	74			129			203
<b>Total</b>		<b>212</b>	<b>120</b>	<b>70</b>	<b>129</b>	<b>263</b>	<b>44</b>	<b>838</b>

## Who is and who ought to be the largest financier of the work of environmental NGOs in Brazil?

The results showed that the general perception is that most of the financial support for NGOs in Brazil comes from international NGOs (25% of the responses), especially among respondents from the government, NGOs and companies, with 31%, 30% and 30% respectively (Figure 1, first line of the graph). This registers the tendency towards there being stronger relations established within society on the global level than among groups domestically. The data also highlights the fact that the participation of international NGOs

65. We would like to thank the team at TNC, who applied the questionnaire at the CBUC; the team at CBDES, who organized the event *Sustentável* 2005, and played a central role in distributing and collecting the questionnaires; and the team *Opinião Consultoria*, who applied the questionnaire in Brasília and compiled the first results; and, finally, Rosa Lemos de Sá, conservation director at WWF-Brazil, for her recommendations on how the results should be presented.

tends to come in the form of resources channelled into the national agenda, although some organizations, such as The Nature Conservancy, go beyond financing projects by engaging directly in conservation actions and political insertion as part of the collective agenda of civil society.

In general, international funds, whether from NGOs or foreign governments, are the chief source of financing according to 40% of those surveyed, having been the most selected option amongst all of the groups in answer to the question: "Who makes the greatest financial contribution to the work of environmental NGOs in Brazil?" Practically half of the government representatives (48%) interviewed and half of the representatives from NGOs (47%) identified international benefactors as the main source of funding.

The Brazilian government was considered the main source of financial resources by only 11% of those surveyed, reaching as low as 7% (universities) and hitting a highest point of only 15% (parliamentarians). In other words, the Brazilian government is not recognised as an important source of funding for the work of environmental NGOs, outranked by all except individual donations, selected as the prime source by only 9% of those interviewed. Companies and foundations came mid-table with 20% of the votes each (Figure 1).

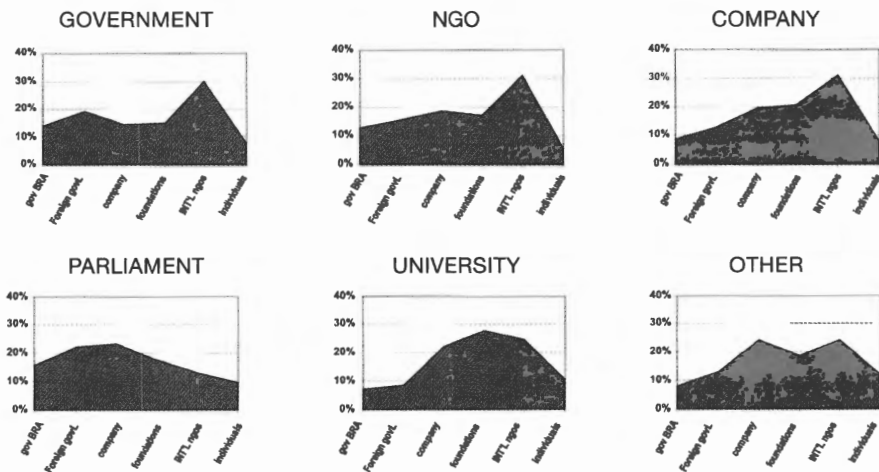


Figure 1 – Who makes the greatest financial contribution to the work of environmental NGOs in Brazil? (Per social group interviewed).



Practically inverting the answers on current financing, the expectations as to who ought to be making the biggest contribution fell heavily upon the Brazilian government, identified by 32% of those surveyed. The weight of expectation upon companies reached exactly the same level (32%). Foundations received 14% of the replies, individuals 9% and, to complete the inversion, foreign governments were pinpointed by only 8% and international NGOs by a mere 5%. We can see from this a relatively lower demand for an increase in the international resources supporting the work of NGOs in Brazil.

The pattern of response was very similar among the different groups, with the exception of the parliamentarians, whose demand upon companies for more funding was the lowest of all the groups, while its minimum “demand” was more evenly distributed amongst the listed sources (Figure 2).

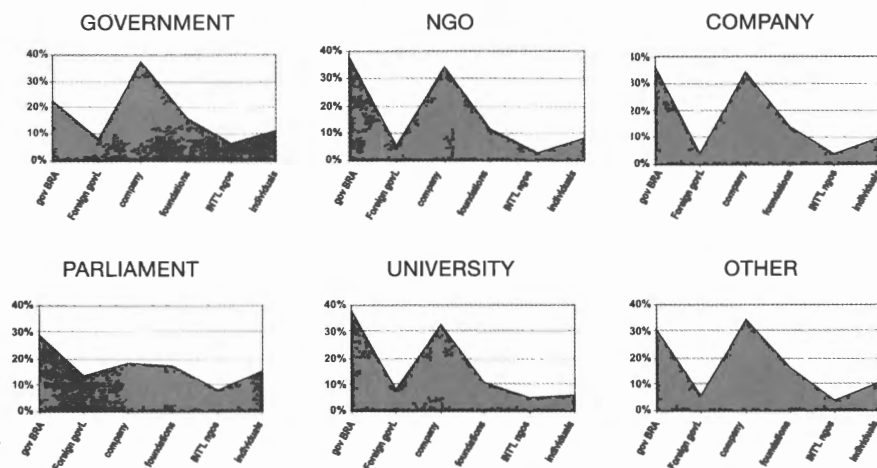


Figure 2 – Who should make the greatest financial contribution to the work of environmental NGOs in Brazil? (Per social group).

## What now, Brazilian government? What now, companies?

We then asked “How?” the Brazilian government and companies operating in Brazil could increase their financial support for the

environmental agenda. We had expected this response pattern, which is why such specific questions had already been included in the questionnaire. In addition, through our preliminary conversations with the TNC Advisory Council in Brazil, with other NGOs and our own experience in fundraising, we had formulated 3 objective options and one default for each on the question "How to bring about a significant increase in investment in conservation by private companies/the Brazilian government?", as shown below:

For the Brazilian government:

- Voting for candidates who prioritise the environmental agenda
- Controlling corruption
- Including environmental action in the incentive laws for the promotion of culture and education
- Other

For companies:

- Becoming more conscious consumers
- Offering fiscal incentives for the environment
- Doing more inspections and charging higher fines
- Other

The first option of practically all of the social groups – a clear majority – was that the best way to increase the financial support for environmental actions from either the Brazilian government or private companies would be through incentive laws. However, this does not in any way mean that there is no place left for those who oppose financial involvement between NGOs and companies; quite the contrary, it behoves this group to fulfil the dual function of assuming a critical posture while answering the call to develop an ampler discussion on the environmental agenda for all of the groups in Brazilian society. In addition to hopefully being able to count on the engagement of

the critics, who always help us examine matters from other angles, proposals for the inclusion of environmental actions in the country's incentive laws would automatically have the backing of 50% of the public surveyed as a way of increasing government investment in the work of environmental NGOs, and from 40 to 50% as an option for the companies (Figure 3).

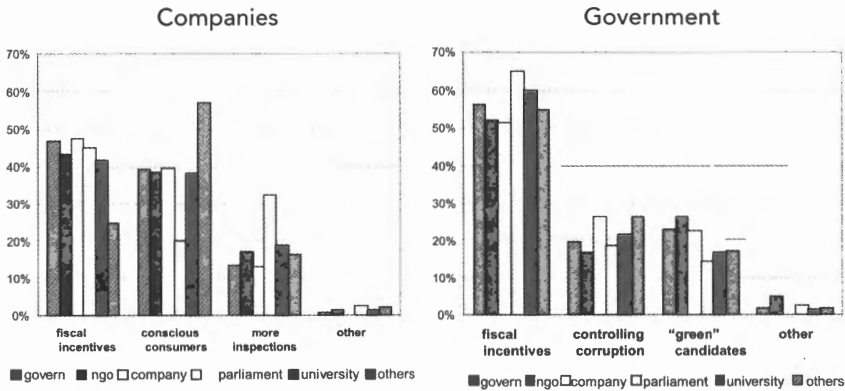


Figure 3 – How can we promote a significant increase in investment in conservation by the Brazilian government? How can we promote a significant increase in investment in conservation by private companies?

Other options also received expressive backing, such as change in consumer behaviour (more conscious consumers) as a way of pressing for more investments from companies. Controlling corruption, more inspections and socioenvironmental voting also warrant reinforcement. Fiscal incentives would not be a panacea. Society needs more efficiency and transparency from its government and more consciousness in the way it consumes and votes, but incentives could provide us with the necessary instrumentation for the directed promotion of these other courses of action.

## Unafraid of being happy: a snapshot of the crises in sovereignty and autonomy and the effects of company track records in degradation

But how could there be a tendency towards a financial proposal that brings NGOs and companies closer together when this still seems to be taboo in the environmental area? The survey explored three expressions of prejudice in this regard: a crisis of national sovereignty caused by international donations; a crisis of autonomy on the part of NGOs receiving corporate donations; and, finally, the possibility of a change in corporate orientation. The questions were:

- Do you think donations from foreign governments to Brazilian NGOs undermine national sovereignty?
- Do you think donations from companies compromise the independence of the work of the NGOs?
- Do you think companies with a history of environmental degradation and the infringement of human rights should have the opportunity to make donations to the work of socioenvironmental NGOs?

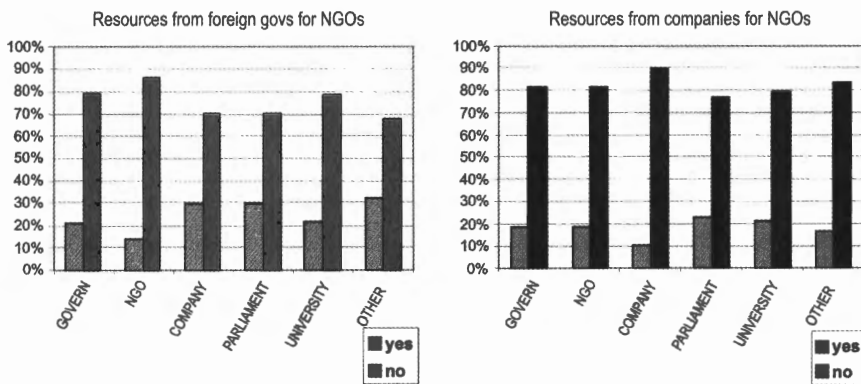


Figure 4 – Do donations from foreign governments to NGOs undermine national sovereignty? Do donations from companies compromise the autonomy of NGOs?

Surprisingly, more than 70% of those interviewed, in all of the social groups, do not believe that the source of funding undermines national sovereignty in the case of foreign government donations to NGOs operating in Brazil, or the independence of their work in the case of corporate donations (Figure 4). This gives a clear indication of the solidity of the institutional mission of non-governmental organizations and the low level of belief that they would be in any way influenced by their donors.

Once again, if the crises are relatively less severe than we had thought, this also reinforces how important it is that future discussions do not neglect the contractual conditions for participation, transparency and monitoring, which sometimes block and sometimes minimise external interferences.

It must also be underlined that there was no specificity in relation to the Amazon among the publics surveyed at the events and in Brasília. The environmental work underway in this region has been more incisively pinpointed as a sign of encroachment upon national sovereignty, especially by the military and by parts of the business community who are against proposals to conciliate development and the environment. We believe that this political tendency – regardless of the rights or wrongs of it – was not captured by the survey.

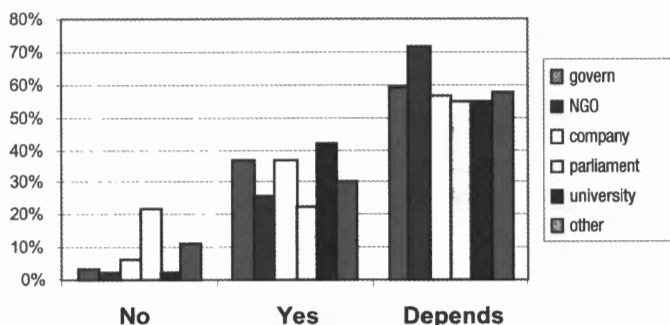


Figure 5 – Should companies with a history of environmental degradation and the infringement of human rights be allowed to make donations to NGOs?

Finally, in relation to the proposal for government incentives for companies making donations to NGOs, we asked if companies with a history of environmental degradation and the infringement of human rights should be allowed to benefit from those incentives. Once again, the majority response was positive. Fewer than 10% answered “no”, expressing the view that companies with a history of degradation should be denied the option for incentives. The parliamentarians were the only group in which the rejection of this possibility rose above 20%. In opposition, some 35% of those surveyed responded to this question with an “unreserved yes”, with approximately 10% variation among the different groups (Figure 5).

However, the majority of those interviewed (>50%), indicated that the right of companies with a history of degradation to avail of incentives for involvement in environmental actions should depend on either their public commitment to a change in corporate orientation (58% of those who answered “depends”) or upon advertising restrictions (25% of those who answered “depends”) (Figure 6).

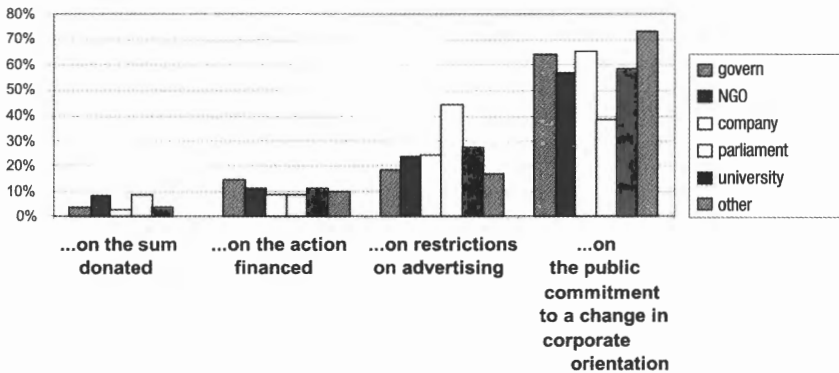


Figure 6 – Breakdown of the 571 respondents who answered “depends” to the question of whether companies with a history of degradation should have the right to avail of incentives.

## Conclusion

The survey showed that there is a general demand for more investment in the work of environmental NGOs in Brazil on the part of the Brazilian government and private companies, while the results also reveal that international sources are currently considered the biggest financial contributors to this work. There was no indication of fears that foreign/international funding for the work of NGOs could result in a loss of national sovereignty. What can therefore be inferred is that the different social groups connected with the environmental agenda that feel there is a need for more resources negotiated in Brazil could be seeking: i) an additional form of funding for the environmental cause; ii) to reinforce the involvement of both the government and companies in the environmental cause through higher levels of funding; or iii) the political relations that could come of a more significant involvement of companies and the government in the work of the NGOs.

The survey also revealed that the social groups consulted, from the government and parliamentarians to the NGOs, companies and academics, do not seem particularly worried about a crisis of autonomy stemming from the NGO/company equation. Furthermore, they indicated that the main way to promote increased financial support for environmental initiatives on the part of the government and companies is the inclusion of private donations to environmental NGOs within government fiscal incentive policies. This reinforces the possibility of a demand for the strengthening of relations between NGOs and the government and private companies, thus consolidating the vision that environmental work greatly depends on the productive interaction amongst these groups.

The majority among all of the groups also believes that companies with large social and environmental deficits should be encouraged and allowed to change their corporate posture and engage in the socio-environmental work of the NGOs. However, a significant number of respondents pointed out that this possibility should firmly depend on the public declaration of a change in corporate orientation, while



others, especially some parliamentarians, would press for advertising restrictions upon such companies in this case.

We therefore conclude by highlighting the importance and favourable context for a warming of national relations between government, companies and society, while also continuing efforts to strengthen relations with governments and companies on the international level, as in the discussions on the implementation of the Convention on Biological Diversity (CBD) at the 8th Conference of the Parties (COP-8). Returning to the matter of funding, the Brazilian government, on both the executive and legislative levels, has initiatives in course towards this end. Proposals to include donations to NGOs for environmental action in government policy for fiscal incentives are the theme of a joint working group established by the Ministries of the Environment and Finance. In addition, the National Congress is currently discussing the 2002 Bill of Social Law 251, approved by the Senate on August 25, 2005 and currently under discussion at the Chamber of Deputies.

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# Caterpillar & The Nature Conservancy: The Great Rivers Partnership

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*"To protect your rivers, protect your mountains".  
(Emperor Li, China)*

## Introduction

An interesting quote, probably from the Emperor Li, was found amongst Chinese historical references dating to the Li T'ang dynasty (618-907 AD): "To protect your rivers, protect your mountains". This more than a millennium-old line has never been truer than it is today. In fact, nowadays, protecting our rivers requires more than simply protecting the mountains, you also need to have strategies in place that can ensure the preservation of rivers as a whole.

In January 2005, The Nature Conservancy (TNC), Caterpillar Inc. and Caterpillar Brasil launched its Great Rivers Partnership, a worldwide initiative to create an innovative model for the conservation and sustainable development of the world's great rivers, thus ensuring the survival of the plants, animals and human populations whose lives and livelihoods depend on freshwater.

The Great Rivers Partnership has directed its efforts towards the Paraguay-Paraná, Yangtze and Mississippi river basins in Brazil, China and the USA respectively. Together, these basins supply a population

of over 550 million and are strategic and priority regions for the conservation of biodiversity worldwide. As on the pilot projects already underway in these three regions, the Partnership aims to guide the conservation strategies for the world's largest river systems and transform the way water supplies in important catchment basins are protected. The 12 million dollar donation TNC received from the Caterpillar Foundation, based in Peoria, USA, also made it possible to set up the Great Rivers Centre for Conservation and Learning, which integrates, via Internet, the conservation and restoration models for the aquatic systems being tested at the three basins and on other projects around the world.

The issue of water supply is a critical problem worldwide and will be one of the most important themes of this century. This is precisely why Caterpillar is helping to make this ambitious project viable, a contribution that reflects its commitment to social responsibility, with emphasis on promoting sustainable development and seeking new ways to meet current needs whilst preserving the environment for future generations. The company believes that by giving support in the forms of technology transfer, the promotion of education and training, the formation of partnerships with local and international groups and social and environmental programs it is making a substantial contribution to improving global quality of life.

According to Welcomme (1985) a "great river" is the system made up of a main river channel and its tributaries, forming a vast floodplain with seasonal flood-cycles sufficiently predictable and regular to allow thousands of animal and vegetal communities to adapt around them and develop life strategies for evolutionary success. Great rivers are also part of the cultural heritage of nations and are essential to their economic wellbeing and development, offering environmental services that are vital to human survival on earth, such as food, water, energy and transport.

In this article we shall make a detailed presentation of the strategies the Great Rivers Partnership has developed for the Paraguay-Paraná river basin and the actions it began in 2005.

## General features of the Paraguay-Paraná river system

The Paraguay-Paraná river system covers approximately 23% of Brazilian territory and sustains 32% of the country's population. The Paraná catchment basin is home to the nation's largest urban centre, Greater São Paulo, with a population of 20 million, while the largest urban centre in the Paraguay basin is the Cuiabá-Várzea Grande complex, with a mere 700 thousand inhabitants. These figures demonstrate the enormous socioeconomic difference between these catchment basins, which is certainly reflected in their environmental management.

The region of the Paraná Catchment Area (CA) is the largest energy producer in the country. Some 60% of the energy produced in Brazil comes from this region, which currently has 176 operational hydroelectric plants.

In terms of land use, approximately 92% of the territory of the Paraná CA has been converted into urban, agricultural or farming areas, while only 26% of the land in the Paraguay CA has undergone a similar conversion.

The actions the Great Rivers Partnership has proposed for the Paraguay-Paraná system reflect such environmental and socioeconomic differences. The actions proposed for the Paraná CA focus on restoration, while those for the Paraguay CA emphasise prevention.

## The challenges of the project

The challenges faced in promoting the sustainable development and conservation of the rivers in the Paraguay-Paraná system are enormous. As already mentioned, the region is geographically vast, heterogeneous in terms of land use and its urban centres present such critical social aspects as poverty, social inequality and water shortages. TNC develops and applies scientific and participative tools to identify priority areas for the conservation of biodiversity in a given region,

to identify threats to biodiversity and their sources and to draw up conservation strategies.

The federal government is spearheading efforts to prioritise biodiversity conservation actions on a national level through the Ministry of the Environment in partnership with various other governmental and non-governmental organizations. TNC assumed an important role in this process when, in 2004, in partnership with the National Water Agency (ANA) and as part of the GEF Pantanal/Upper-Paraguay Project, it completed the “Eco-regional Plan for the Pantanal and the Upper-Paraguay Basin”.

The Upper-Paraguay Basin, which houses the Pantanal, the world’s largest and most important wetland, is still well preserved thanks to the limitations the Pantanal’s particular flood-cycle imposes upon large-scale human occupation. On the other hand, the terrain circling the Pantanal, predominantly savannah-covered plateaux, is subject to intense land use, particularly in the forms of grain crops and cattle ranching. The riverheads that drain into the wetland plains are located exactly in these surrounding plateaux, where the intense processes of erosion around the heads and the river sedimentation provoked by uncontrolled cattle ranching now pose a critical threat to the Pantanal.

In the Paraná Basin, the threats to the rivers are strongly connected with the process of urbanisation, which has resulted in pollution through domestic and industrial effluents. In addition to this, the high number of dams and locks for the generation of hydroelectricity and river transport has altered the rivers’ natural water flows. Of all the impacts upon the Paraná Basin, the destruction of ciliary forest is undoubtedly one of the most critical.

## Strategies for the Upper Paraguay Basin

The Brazilian Forest Code instituted Areas of Permanent Preservation (APPs), and ciliary forest is one of the APP categories. It also institutes legal reserves on rural properties, a regime that requires that a continuous portion of a given property be given over to the preservation

of the vegetation and soil. Unlike in APPs, the sustainable use of natural resources is permitted in legal reserves. In this sense, the Forest Code brought a great opportunity insofar as it allows the landowner to prescribe the legal reserve inside the property or, should the land be extremely productive, compensate outside it. This off-property compensation mechanism requires very clear and robust economic and ecological criteria that the law does not specify. However, in terms of the conservation of biodiversity, a large block of various legal reserves is much better than a splattering of disperse fragments of legal reserves with no interconnections.

The exchange and compensation mechanism in legal reserves, besides amounting to a great opportunity for conservation, also valorises the existing native vegetation and creates an exchange market that is economically attractive to less well-endowed landowners. An example to illustrate this would be a landowner whose land is of little economic value but of great environmental value. Compensations could be made on his property through leasing, rights of use or purchase contracts between rural producers, thus resulting in financial income for the owner. However, in the absence of the compensation mechanism, this producer, seeing that his land was not naturally economically fruitful, would have to find some way of extracting whatever income he could from it, probably resulting in deforestation or some other form of environmental damage.

*What does the exchange and compensation mechanism for off-property legal reserves have to do with the preservation of rivers?*

The simple fact of landowners maintaining and/or restoring their ciliary forest is already a tremendous gain in terms of improved water quality and conditions of aquatic river environments. If the area for river protection were expanded through the allocation of contiguous legal reserves, complete with significant ecological corridors, this would vastly improve the conditions for the aquatic flora and fauna living in those rivers and the terrestrial ecosystems. "Looking down

from above”, we would have a zoning with graded levels of protection, ranging from strict protection (APPs/ciliary forest), to intermediate protection (legal reserves, where the sustainable use of natural resources is permitted), to low protection (cattle raising that has adopted ecologically friendly practices), which would be extremely propitious to the conservation of the rivers.

In the case of the Upper-Paraguay Basin, as the critical problems stem from the improper management of the plateau terrain, TNC is concentrating its efforts during this first phase of the Great Rivers Partnership on the forest legislation compliance strategy, which can be broken down into three components:

1. Restoration and preservation of ciliary forest;
2. Registration of legal reserves and off-property compensations;
3. Adoption of best ranching practices.

This strategy is being implemented in the state of Mato Grosso in the sub-basins of the São Lourenço and Cuiabá rivers, identified as conservation priorities in virtue of their high levels of biodiversity and because they are threatened with soil degradation through the processes of erosion resulting from badly planned ranching practices. Initially, the strategy is being implemented in partnership with the Environmental Secretariat of Mato Grosso (Semat), the Mato Grosso Farming and Ranching Federation (Famato) and the non-governmental environmental organization CMCV – *Centro de Monitoramento da Cobertura Vegetal* (Vegetal Cover Monitoring Centre). This partnership between TNC, CMCV, the environmental organ for the state of Mato Grosso and the representative organ of the state’s most important productive sector is an innovative first for these organizations, as it consolidates a productive dialogue between sectors with a history of mutual antagonism. This partnership will bring solutions capable of attending the different interests of the institutions, thus reconciling preservation with development.

Approximately 2 thousand rural properties from the São Lourenço and Cuiabá basins will be registered over a period of 6 months using



technologies to monitor vegetal cover via satellite, geographic information systems and an on-line database that can be fed via the Internet. The strategy will result in the protection of some 1 million hectares of legal reserve, which, according to the landscape planning, will also serve to improve the region's water resources.

The Taquari catchment basin, a part of the Upper-Paraguay basin, with 90% of its distribution in the state of Mato Grosso do Sul, suffers from environmental problems similar to those of the São Lourenço and Cuiabá basins, or even worse. The strategy proposed for the basins in Mato Grosso is likewise being discussed with the Secretariat for the Environment of Mato Grosso do Sul (Sema-MS) and the Public Ministry of the state. Of the erosion processes in the Pantanal, 70% are concentrated in the Taquari basin and it is essential that the recovery effort be focused on its riverheads. The current impediment to the implementation of the strategy is the state's legal framework, which limits the use of cheap and fast technologies for the registration of rural properties. TNC is still in negotiations with the state's environmental organs with a view to having this specific legislation changed.

## Strategies in the Paraná Basin

Rivers provide environmental services that are vital to human survival on the planet, such as water, foodstuffs, energy and transport. For centuries humanity has availed of these services free of charge and in an unsustainable manner. Water is a scarce and finite resource that must be given its economic value, otherwise it will become even scarcer through irrational use. This is one of the principles of Brazil's recently passed Water Law (n<sup>o</sup> 9433/97), which handles the use of water resources. Water rates are now charged as one of the five instruments outlined in the National Policy on Water Resources. However, it is necessary to demystify the charge as just another tax to be paid by the Brazilian population, already one of the most heavily taxed in the world. Water rates should be portrayed as something

more akin to the monthly service charges in apartment buildings, where the resources raised are reinvested in the upkeep and preservation of the catchment basin.

Another innovative component of the Water Law is the establishment of basin committees. The committees are forums made up of users and representatives from the government and civil society, a tripartite composition modelled on the French management approach, where decisions on water use are discussed and taken in unison. This experience is still quite nascent in Brazil, as the legislation itself is very recent (8 years), while the National Water Agency (ANA), set up to implement the National Policy on Water Resources, is only five years old. In Brazil, only one basin committee has so far implemented the water rates: that of Paraíba do Sul, which encompasses the states of São Paulo, Rio de Janeiro and Minas Gerais.

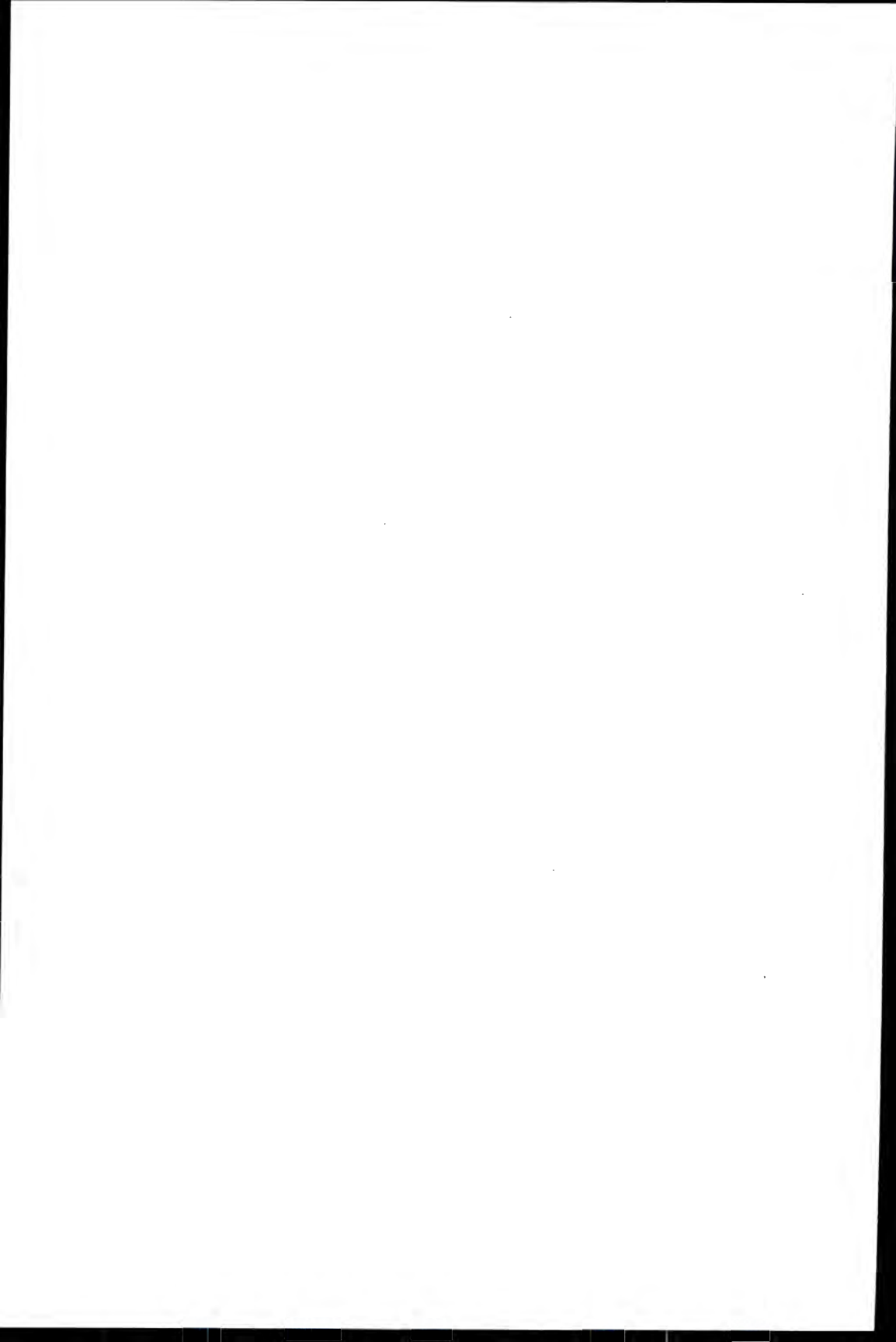
The next basin committee to introduce water charges will be that of Piracicaba-Capivari-Jundiaí (PCJ). The preliminary figure estimated on the intake of water rates is approximately R\$ 20 million. The TNC strategy is to work with this committee, and others yet to be consolidated, to ensure that at least 20 to 30% of the money brought in by this charge is reinvested in large-scale ciliary forest restoration projects. The polluter/payer principle advocates that the individual who pollutes should shoulder the cost of undoing the damage for the general public good, shared with all of society and those who benefit from that good. The flipside of this is the supplier/receiver principle. As water is an asset with an economic value, everyone who collaborates indirectly in the production of water in a catchment basin should be recompensed for the indirect benefit this generates for society.

Within the scope of the Great Rivers Partnership, alongside other partner institutions, such as the Secretariat for the Environment of São Paulo and the National Water Agency, payment for environmental services in catchment basins is the key strategy TNC has adopted in the region of the Paraná basin. If the model of payment for environmental services to be tested proves a success, a permanent incentive for the plantation and recuperation of ciliary forest will assuredly be established in the state of São Paulo, redressing a deficit

of more than a million hectares of ciliary forest statewide and resulting in improved water quality for the region. This initiative could and should be adopted by other regions of the country that suffer from the same problems.

## Conclusion

This initiative demonstrates the transformative power of conservation and development models when levered by the combined forces of different sectors of society. The Great Rivers Partnership is about facilitating and promoting the union of companies, non-governmental organizations, research institutions, governments and local communities from different countries around a shared agenda, resulting in benefits for the conservation of biodiversity and for local populations.



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# Companies in the Sustainability Network

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Fernando Almeida and Beatriz Bulhões

Human activities interfering in nature is nothing new. Our most primitive ancestors hunted, fished, picked fruits, cut wood and dug up metals in order to meet their needs. The emergence of the earliest civilizations required the use of more natural resources, and this need has continued to grow. The larger and more evolved civilization became, the more it had to exploit nature.

A brief study of the history of Brazil serves perfectly well as a model for analysing the anthropic relationship with the environment. Let us imagine the Atlantic Forest before and after the arrival of the first Portuguese voyagers, some 500 years ago. The original cover of this rich and complex ecosystem has been reduced to a mere 7%. First came the extraction of brazilwood as a source of dye for the clothes of the European nobility. Then came the cycles of sugar, coffee and cattle ranching. In the name of commerce, the same predatory approach was practiced by the Spanish, English, Dutch and French in the Americas, Africa, Asia and wherever else their ships happened to make port.

The process of harm wreaked upon natural resources was aggravated from the Industrial Revolution on and became unsustainable after the Second World War, with the establishment of a dichotomy between modern society and nature. One fact became clear: the demand for increasingly higher and more materialistic standards of living is incompatible with the capacity to maintain the services provided by the ecosystems.

This realization served as the point of departure towards the set of concepts enveloped in the notion of sustainable development, now the only alternative capable of reverting the trend of environmental decline, creating the conditions for the insertion of the base of the social pyramid within the market and guaranteeing an economically prosperous society; in short, the only alternative capable of ensuring the survival of the natural resources, the people and their business.

As a member of the World Business Council for Sustainable Development – WBCSD, the *Conselho Empresarial Brasileiro para o Desenvolvimento Sustentável* – CEBDS (Brazilian Business Council for Sustainable Development) was formed in 1997 with the mission of representing companies installed in Brazil in the process of integrating the principles and practices of sustainability in the business context.

The network of councils with ties to the WBCSD numbers 50 business councils worldwide. This organizational structure enables the members to exchange and share information and disseminate and encourage the adoption of best practices. In Brazil, CEBDS functions as a platform institution and interlocutor for companies concerned about and committed to sustainable development. With a proactive vision intertwined with the changes and tendencies underway in this globalised world in which we live, the CEBDS orients companies on the best ways to minimise the risks and threats its sees coming and to identify the business opportunities that arise from those changes.

## On the environmental wave, the first step

The orange light came on in 1972, the year the United Nations Conference on the Environment was held in Stockholm. Scientists and some civil organizations warned of disaster and of the unpredictable consequences that threatened humanity unless we stopped mistreating nature. From that moment on, the environmental dimension, though still restricted to academic circles and a handful of activists, broke once and for all onto the formal agenda.

From this point on, there was an explosion in the number of non-governmental organizations denouncing and combating predatory practices in all their forms. The first Green Parties also began to emerge as a political line raising the flag of environmental preservation in parliaments and on political campaigns. In the government sphere, ministries, secretariats and environmental control agencies were created. A legal framework was established to regulate environmental interventions and to punish infractions. The public ministries, as the agents responsible for enforcing the law, created environmental centres for this specific work.

The environmentalist movement has an undeniable historical importance and has continuously changed its profile over time. Though they remain vigilant and true to their founding principles, environmentalist entities have begun to adopt a new behaviour, one based on the understanding that, alone, they stand no chance of going beyond protest to truly pressuring public institutions to ensure the law is upheld.

They saw that it was necessary to reach an understanding that could contextualize concern for the environmental system, taking into account the human being and its capacity to produce wealth. In other words, it was necessary to go beyond legal control.

This new vision was presented to the world in 1987, again in Stockholm, by the Brundtland Commission's report to the UN, entitled "Our Common Future". Thus was born the concept of sustainable development.

The United Nations Conference on the Environment and Development (UNCED), held in Rio de Janeiro in 1992, was the first step towards putting sustainable development into practice. This meeting, known as Rio-92, brought together 170 Heads of State and was the source of various important conventions, among them the Convention on Biological Diversity (CBD). By signing up to these documents, the governments committed to adopting a set of actions in defence of the planet's natural resources, controlling the emission of greenhouse gasses and fighting poverty, among other targets. A second conference was scheduled for ten years later.



## Transforming potential into reality

The World Summit on Sustainable Development was held in Johannesburg, South Africa, in 2002. In addition to assessing what had been done of any significance over the course of the ten years since Rio-92 (both positive and negative), this meeting was also the stage for two important happenings worth further mention. The first of these was the signing of a document in which the contracting parties committed to environmental and social targets. The second was the presence of the business sector. Unlike at Rio-92, companies actively participated at the Johannesburg meeting.

The expressive participation of the business sector in Johannesburg did not happen by accident. In fact, it reflected a radical redefinition of corporate management that had occurred during that period of ten years. At Rio-92, the Swiss businessman Stephan Schmidheiny made a solitary speech in which he launched the radical idea into the world that companies would only be capable of guaranteeing their business survival through the proper management of the natural resources involved in their production processes. Schmidheiny's words had an exotic ring to them. After all, at that time, the environmentalist movement was merciless in its attacks on companies.

The seed Schmidheiny sowed bore its first fruit soon after. The emergence of the WBCSD, bringing together businesspeople with positions similar to those of the precursor of corporate sustainability, was the point of departure for the formation of a large network of national councils. Working in integration, these councils began to exchange information and interface with other sectors of society and today play a decisive role in the process of change.

The CEBDS originated as a part of this network and has contributed to expanding it, always acting from the principle of the transversal interrelations among the themes that make up sustainable development and the effective integration of all of the players in this tri-polar world: companies, governments and civil society organizations.

Congregating the most varied corporate segments and operating in an integrated manner within the three dimensions of sustainability

(the economic, social and environmental), the CEBDS acquired a unique character in Brazil and has had growing success in its articulation in pursuit of sustainable development. The council organizes and carries out its work through six distinct technical chambers: Biodiversity and Biotechnology, Education for Sustainability, Energy and Climate Change, Sustainable Finances, Environmental Legislation and Corporate Responsibility.

The chambers are presided over by representatives from associate companies and are composed of the best corporate staff. This technical empowerment has helped open up new access for the CEBDS, as a representative of the business community, to important institutional organs, such as the Commission on Sustainable Development and Agenda 21 (CSD), the Genetic Heritage Management Council (CGEN), the Managing Committee for Cleaner Production, the Organizing Committee of the 2<sup>nd</sup> National Conference on the Environment, the Biotechnology Competitiveness Forum, the Brazilian delegations to the Conference of the Parties and the Climate Change and Biodiversity Conventions.

This credibility explains why the CEBDS was invited by the government, more specifically by the Ministry of the Environment, to team up with the Secretariat of the Convention on Biological Diversity (CBD), the British Ministry of the Environment, the IUCN and Insight Investment in an initiative to lead private sector engagement in the implementation of the CBD. This initiative, entitled "Business and the 2010 Biodiversity Challenge", has thus far convened two meetings. The first of these was held in London in January 2005, with the presence of companies from various parts of the world. Representing Brazil were the CEBDS and four companies (CVRD, Petrobras, Votorantim Papel e Celulose and Natura Cosméticos). The second meeting, proposed by the CEBDS and the Ministry of the Environment, was held in São Paulo in November 2005.

The mobilization of the business sector will be decisive in transforming Brazilian potential in the field of biodiversity into economic development, with social inclusion and the rational and sustainable use of natural resources as its results.

As we know, Brazil is holder of the largest share of the world's biodiversity (15 to 20% of the biodiversity on earth). Half of the Brazilian GDP comes from the direct use of biodiversity through agriculture, cattle ranching, fishing, aquiculture, extractive forestry, silviculture and tourism. In addition to this, the country also possesses the richest socio-diversity in the form of its 200 indigenous peoples and array of local communities (*quilombolas*, *caiçaras*, *seringueiros*, etc.)<sup>66</sup>, who together harbour an inestimable wealth of associated traditional knowledge on the conservation and use of biodiversity.

The participation of the country's business sector at the front line of this process signalled a new era, broadening the range of its articulation in the area of biodiversity and biotechnology. It reflects one of the fundamental principles that guide the work of the CEBDS: provide the companies installed in Brazil with the strategic knowledge they need to plan and take decisions.

Approved at Rio-92 and today ratified by 188 countries, including Brazil, the Convention on Biological Diversity (CBD) has proved a vital instrument in guaranteeing the implementation of the most important environmental conventions, establishing rules for conservation, rational use of the planet's biological and genetic resources and the sharing of the benefits arising from the use of components of biodiversity.

However, in 1992, the Convention was still dominated by a conservationist vision. Biodiversity was practically a synonym of conservation. The business sector, however, did not share that view. There was an atmosphere of general animosity against companies, which were seen as the main culprits behind the destruction of ecosystems and the endangering of species. At the Conferences of the Parties (COPs), the presence of company representatives was timid and often camouflaged for fear of possible scuffles with more

66. Respectively: the descendants of members from former colonies of runaway slaves; rustic coastal settlers; forest communities of rubber tappers.

radical environmentalists. As time went by and the discussions became more protracted, the governments, non-governmental organizations and companies matured. Today, all parties recognise that biodiversity concerns all sectors of society. The responsibility for the planet's present situation of deterioration lies with us all. That said, the task of searching out solutions for a better world is likewise the shared responsibility of companies and society in general. The CBD gradually opened up to the participation of the business sector and one could say that today its participation is essential in these discussions and negotiations. Multi-sectorial dialogue greatly enhances the chances of successfully implementing the Convention's objectives. New pacts need to be sealed in response to challenges and threats as they arise, and targets must be revised and retraced.

The "Business and the 2010 Biodiversity Challenge" initiative, which envisaged the more effective engagement of the business sector in the implementation of the CBD, was proof of this newly acquired maturity on behalf of the parties involved. Among the global legal and political benchmarks, it is worthwhile mentioning some that are directly related to business activity, such as the Cartagena Biosafety Protocol, which sets the rules for the transboundary movement of live genetically modified organisms (GMOs); the International Treaty on Phytogenetic Resources for Food and Agriculture, established within the scope of the FAO; the Bonn Directives, guidelines for the creation of national law to regulate access to genetic resources and the sharing of the resulting benefits (and to curb biopiracy); the Directives on Sustainable Tourism and Biodiversity; the Addis Abeba Principles for the Sustainable Use of Biodiversity; the Directives for the Prevention, Control and Eradication of Exotic Invasive Species; the Principles and Directives of the Ecosystemic Approach to the Management of Biodiversity; and the beginning of the negotiations on the International Regime for Access to Genetic Resources and Benefit Sharing.

## Millennium ecosystem assessment, a new vision

At the end of March 2005 the Millennium Ecosystem Assessment report was simultaneously published in New York, London, Beijing, New Delhi and Brasília. Produced with support from the UN, WBCSD, NASA and in partnership with other business, academic and civil society institutions from all over the world, the programme was developed by 1,360 scientists from 95 countries and represents the largest ever scientific study on the planet's ecosystems.

It is worth emphasising the new view the study presented on the natural resources of our planet, putting an end to the romantic vision of "mother nature". The specialists are categorical in defining ecosystems as the providers of the basic services fundamental to our survival: foodstuffs, drinkable water, wood, fibres, biochemical and genetic resources, soil formation, the prevention of flooding, climate regulation, the recycling of nutrients, as well as cultural services, including those of a religious, recreational and educational nature, and other services, such as ecotourism, among others.

Accompanied by a board, on which I participated as a representative of the WBCSD, the study was prepared over the course of five years – from 2001 to 2005 – and scientifically verified that, today, 15 of the 24 services provided by the earth's ecosystems – such as the provision of freshwater, fishing and soil and climate regulation – are either highly degraded or are being used in an unsustainable manner. The study ends on a warning: the tendency is for this damage to get worse over the next 50 years, putting the survival of future generations at risk.

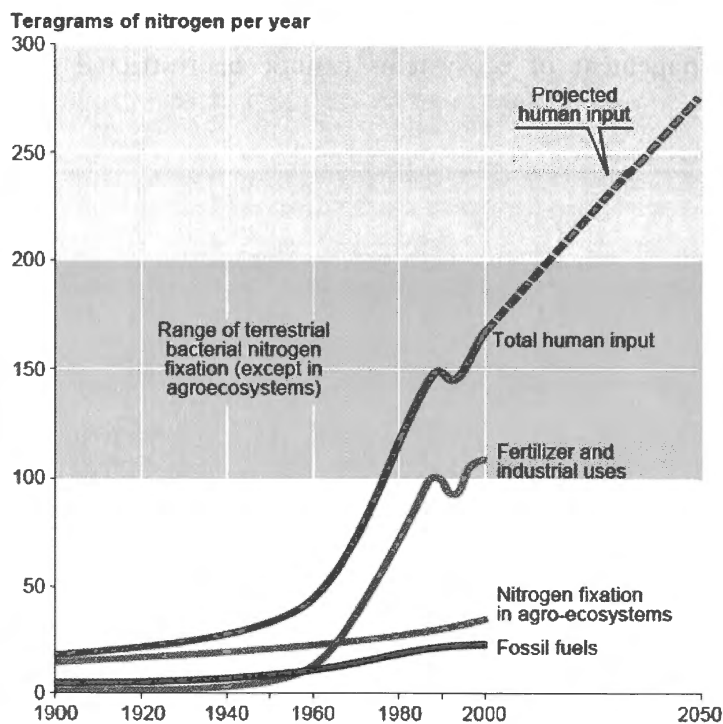
Important rivers like the Yangtze River in China, the Nile in northern Africa, the Colorado in the USA, no longer make it to the ocean at certain times of the year, thus degrading the marine fauna and flora and correlated productive livelihoods. Despite the growing demand, fisheries have slumped since the 80s. With the advent of industrial processes, the number of traditional fishing boats has been



cut by 10%. Such species as tuna, swordfish and dogfish have shown losses of up to 90% (graph 1).

In terms of basic agricultural raw materials, the presence of nitrogen and phosphorus in the ecosystem has more than doubled since the 60s (graph2). The nutrient content that goes unincorporated into the vegetal biomass is washed away by the rivers, lakes and oceans, often provoking super-fertilization, which makes the water unusable for public supply, agriculture and recreation, as well as killing off the fish.

The globalisation of nature is another limiting factor upon the ecosystem services, whether in the form of dominant species shifting between oceans in the wake of large cargo ships, or the voluntary introduction of species from other habitats, as occurred with the pigs left behind on some of the Galapagos Islands, which went on to devastate the local fauna.

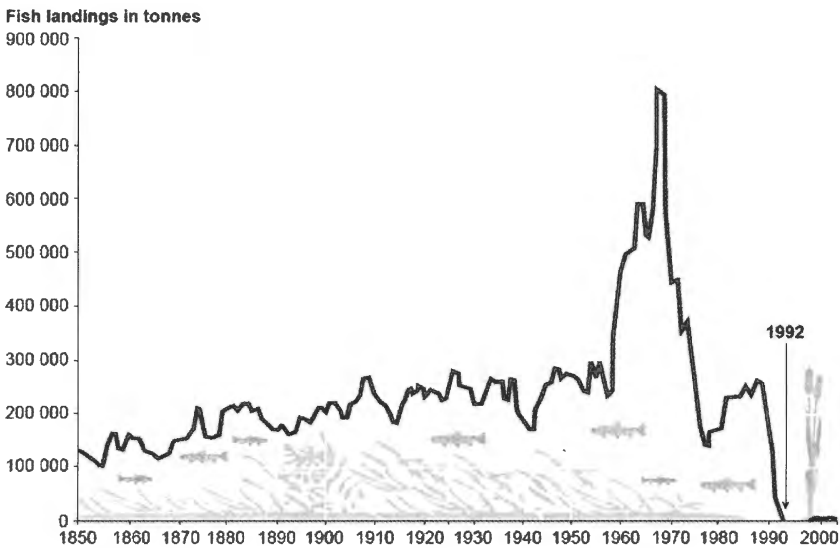


Graphic 1

The carbon stockpiling service provided by the photosynthesis in growing forests and by the oceans has been overrun by the emissions caused by the burning of fossil fuels, causing coral reefs to dysfunction, reducing the biodiversity fundamental to the production of new medicines and cosmetics. Blizzards, floods and other unprecedented climatic reactions increasingly threaten to put insurance companies out of business.

Finally, extreme poverty is intrinsically related to the destruction of natural assets and is the gravest impediment to economic undertakings. The comparison between neighbouring countries on the same island, Haiti and the Dominican Republic, emphasises this premise. Having completely destroyed its vegetal cover, Haiti became the poorest nation in the Americas.

The prognostic in the medium and long-term could be different if we – society, the government and the business community – accept that these assets and services should have value and be priced accordingly and that they are limited. We have to be aware that the management of ecosystems cannot be restricted merely to



Graphic 2



government or private company-owned protected areas. Technological innovation will play a fundamental role in a new paradigm focused on the perennial character of the services provided by nature.

Black markets – of animals and wood, for example – have to be wiped out by the conventions and by national laws, and the clients of these markets must be boycotted. The cultural aspect will be decisive, as lifestyle rather than global population growth will determine the level of human impact upon the ecosystems and their – and, by extension, our – chances of survival.

## Biodiversity and the CEBDS

CEBDS, as already mentioned, functions through theme-based chambers. The Biodiversity and Biotechnology Chamber was created in 2000, upon the invitation of the Ministry of the Environment, to lead a survey among the business community regarding a National Biodiversity Policy. Under the presidency of associated companies, the Chamber played a decisive role, preparing a subsidiary document with the principles and directives the private sector believed ought to feature in the above-mentioned policy. In that same year, the Provisional Measure regulating the access to genetic resources and associated knowledge and benefit sharing was published in Brazil. This was the first step towards the consolidation of the Chamber's work. We have actively participated in these discussions ever since, sending proposals for alterations to the wording of the legal text, holding meetings with various ministries, such as the Ministry of State, and with parliamentarians in Congress. We also made our presence felt at public assemblies, seminars, round tables and other forums of debate. On the international scene, we began participating at all of the important events held since 2002, starting with the Fourth Conference of the Parties. This experience equipped us to assume the leadership in mobilising the business sector and to work on the organization of COP-8 as an official member of the organizing committee.

Within this discussion process, the CEBDS has drawn the attention of companies and the government to the conservation of biodiversity in private areas. Our proposal is that the importance of private protected areas be a relevant reinforcement in the national conservation drive. In 2002, the CEBDS and World Conservation Union signed an agreement with the intention of encouraging the creation of a network of private conservation units with shared management plans and mechanisms to exchange information and technology with a view to expanding and optimising the individual efforts of each company. This project is underway and there is a chance of more partners coming on-board. We have deepened our network of partnerships through agreements with institutions of the highest order in the area of biodiversity and biotechnology, such as WWF, ANA (National Water Agency), Abema (Brazilian Association of State Environmental Entities) and Abrapi (Brazilian Association of Biotechnology Companies), among others.

There is still much to be done, though a lot has been achieved by companies with a vision of the future, those who are a step ahead of the facts. The CEBDS mission is to make this team of companies grow and ensure that the certainty that biodiversity is an indispensable service provider be shared with an even larger number of corporations in the interests of a better future.

## Biodiversity and companies

We are moving in the right direction. There has been a qualitative change in focus in recent years. In the past, companies showed some apprehension towards environmental issues, usually worrying about the risks and costs they entailed. Today, however, concern for environmental issues represents a competitive edge, a way of cutting waste, avoiding pollution and, consequently, of offering better quality services and products.

When we speak of companies and economic activity, we are referring to an array of players and sectors, such as the extractivist

industries (mining, petroleum and gas), the banking and financial sector, activities directly related to biodiversity, like agriculture, fishing and forestry and water management, the tourism and energy sectors, industrial production companies, and many others. Economic activity also operates on different scales, ranging from small-scale arts and crafts through small- and medium-sized companies, up to global multinationals.

These economic activities depend on the services provided by the ecosystems, the species and the genetic material used in their processes and products.

The financial institutions, for their part, have recently begun to understand that the survival of their business requires that they incorporate other dimensions besides the economic angle when analysing credit risk. Worldwide, a group of institutions, 31 so far (five of them Brazilian), have adopted the Equator Principles, which establish socioenvironmental criteria for project financing. Stock Exchanges have also come in line with this trend, creating sustainability indexes that list the companies that demonstrate the greatest level of commitment to sustainable development. In Brazil, the São Paulo Stock Exchange (Bovespa) created its own Corporate Sustainability Index, the ISE. Bolstering this tendency, individual investors and investment institutions are becoming increasingly more attracted to socially and environmentally responsible companies.

Following this process at close quarters and convinced of the privileged role the financial sector can play in fostering sustainable development and in coming up with innovative solutions, the CEBDS created the Chamber of Sustainable Finances. Initially constituted by the banks Itaú, Real, Banco do Brasil, Bradesco and BM&F, one of the principal missions of the new chamber is to promote discussion and provide orientation to banks on how best to revise their project financing and investment criteria. Two special funds incorporating this approach have already been created – ABN AMRO Real's Ethical Fund and Itaú Social Excellence.

Many Brazilian companies have innovated and explored opportunities for the sustainable use of components of biodiversity in

cosmetics, natural medicines, the bioprospection of new molecules, active principles and new materials. However, such initiatives have to be more widely known and copied in order to truly make the most of the competitive advantage its vast biological diversity confers upon Brazil.

When companies do not deal with environmental matters in an adequate manner, they expose their economic activities to certain risks, such as doubt being cast over their licenses to operate, ruptured supply chains, a sullied brand image, consumer boycott, fines, poor stock market performance and valuation, among other harmful effects. Conversely, by incorporating the theme of biodiversity within their action plans and corporate responsibility policies, whether environmental, social or economic, companies can open up a whole gamut of new opportunities and rewards, such as greater public credibility, enhanced brand reputation, lower costs in remedial action and investor loyalty, among other tangible and intangible benefits.

Various sectors, among them the forestry, fisheries, agricultural and tourism sectors, have established the practice of certifying responsible companies with a view to encouraging the sustainable use and protection of biodiversity.

Other themes with which the CEBD deals, such as technology transfer and intellectual property rights, are crucial to the private sector and are constantly treated in discussions and negotiations.

By engaging in the implementation of the CBD, the companies of the private sector have to broaden their perception of the types of benefit that can come of this engagement. They should not merely aim for short-term financial returns, but, above all, hope to add long-term value, especially in terms of intangible values and sector and multi-sector-wide partnerships.

## The business & 2010 biodiversity challenge initiative

The potential benefits of company engagement with the CBD are recognized in Article 10 (e) of the Convention, which encourages

cooperation between governmental authorities and the private sector in the development of methods for the sustainable use of biological resources. The need for private sector participation in a range of themes besides sustainable use was later reinforced in the various decisions made at COPs 3, 4, 5 and 6. Among these themes we could cite the transfer of technology, agricultural and forest biodiversity, incentive measures, information and knowledge on biodiversity, intellectual property, access to genetic resources and associated traditional knowledge and benefit sharing, among others.

In 2002, the VI Conference of the Parties (COP-6) adopted a Strategic Plan for the Convention in which it pledged to achieve a significant reduction in the current rate of biodiversity loss by 2010, as a contribution to poverty alleviation and to the benefit of all life on earth. This target was endorsed by Heads of State at the World Summit on Sustainable Development (Johannesburg 2002) and by the United Nations General Assembly. However, it was recognized that this target would be impossible to achieve without the involvement of all of the relevant players. In fact, objective 4.4 of the Strategic Plan stresses the importance of engaging key stakeholders, including the private sector, in partnerships for the implementation of the Convention, integrating biodiversity issues in their sectorial and inter-sectorial plans, policies and programs. In relation to private sector engagement, a specific challenge was set, known as the "Business and the 2010 Biodiversity Challenge".

The first meeting of the Initiative was held in London in January 2005 and concentrated on industries with direct impact on biodiversity and those with impact indirectly through their productive chains. The second meeting was held in São Paulo in November 2005 with the participation of a wider range of companies, including those connected to the theme of access to genetic material and benefit sharing and the financial sector.

Both of these meetings were organized by the Secretariat of the Convention on Biological Diversity, the British Department of the Environment and Agriculture, the Brazilian Ministry of the Environment, the World Conservation Union (IUCN), the Brazilian Business



Council for Sustainable Development (CEBDS) and Insight Investment.

With the support of three CEBDS-associated companies – Natura Cosméticos, Companhia Vale do Rio Doce (CVRD) and Petrobras – the São Paulo meeting united a group of 95 experts from companies, civil society and the government, divided into the following four working groups: (1) industries with a direct impact on biodiversity; (2) industries with indirect impact on biodiversity through their productive chains; (3) industries with some connection to access and benefit sharing; and (4) the financial sector.

The goal of this meeting was to identify mechanisms and actions that could lead to the private sector's effective engagement with the Convention. These mechanisms could either be formal, i.e. within the scope of the CBD, which could establish directives and recommendations for them through the COPs, or informal, i.e., adopted on the initiative of the companies, civil society or the government themselves, or even through partnerships between different players. Among these mechanisms we could mention certification (forestry, fisheries, agricultural and tourism), codes of conduct, sector-based best practice guides for biodiversity, new criteria for credit analysis and project financing incorporating social and environmental sustainability, environmental compensation, the dissemination of information on biodiversity, education and training.

Another important contribution of the private sector was the adoption of eco-efficiency by various companies. Eco-efficiency is a concept under which pollution and the generation of waste are considered signs of production process inefficiency requiring the adoption of preventive strategies, corrective technologies and cleaner processes throughout the entire product life cycle, thus reducing direct impact upon natural resources, biodiversity included. Having understood that these actions benefit company health and guarantee market survival through increased brand strength and credibility, a growing number of companies have turned to voluntary initiatives, promoting and implementing self-regulation and assuming greater responsibilities to ensure that their activities do not cause adverse impact upon human health and the environmental system.

## Small company strategy

On this path, CEBDS was one of the founders and is the national coordinator of the Brazilian Cleaner Production Network, which encompasses various partners and focuses on micro and small enterprises.

The Network plans to hold parallel events at COPs 8 and 9 in a bid to promote and divulge best practices already in use and joint actions for the benefit of biodiversity, as well as proposing plans of action to help reach the 2010 target to reduce current rates of biodiversity loss.

The mobilization of the Brazilian business community to definitively consolidate the eco-efficiency culture would make no sense if we omitted the medium, small and micro companies. After all, this segment represents 99% of the 5.6 million companies in the country and is the root source of job creation, which is precisely why its inclusion has always been on the list of priorities of the CEBDS.

Since the foundation of the Council, we have been insistently asked by audiences at speeches about the environmental, social and economic benefits offered by sustainable development: "how can small companies, with limited financial capacity, invest in eco-efficiency?".

These questions gave form to the network's clear goal, namely to spread the concept of eco-efficiency and the *PmaisL* methodology to small companies in accordance with the model conceived by the UN.

During the experimental phase of the program, from 1999 to 2002, the results obtained by the pilot companies belonging to the five state centres (Rio Grande do Sul, Mato Grosso, Minas Gerais, Bahia and Santa Catarina) indicated that we were on the right path. The approximately 200 companies involved obtained, over the course of three years, an annual reduction of R\$ 18 million in expenses on raw materials, water and energy. For every R\$ 1 invested, there was a return of R\$ 4.

In addition to the economic gains, the environmental benefits were also heartening, with annual reductions of six million tons of raw materials; 350 thousand cubic metres of water; three million



kWh of electricity; and a million cubic metres of gas. The figures for reduced direct environmental impact were also extremely positive, with annual reductions of 5.5 tons of atmospheric emissions; 167 thousand cubic metres of liquid industrial effluents; 911 tons of solid waste and 3.5 tons of hazardous waste. Recycling processes made it possible to reuse 230 tons per year of various forms of waste.

Encouraged by the excellent results of the first experience, Sebrae and CEBDS reinforced their partnership and from 2002 began to set up centres in a further 13 states (Alagoas, Amapá, Amazonas, Ceará, Federal District, Espírito Santos, Mato Grosso do Sul, Pará, Pernambuco, Rio Grande do Norte, Rio de Janeiro and Sergipe). Today there are centres in 18 states, with only a little further to go before we reach all 27, including the Federal District. This second phase required R\$ 2.4 million in investment, yielding an annual reduction of R\$ 5.6 million in spending on raw materials, water and energy.

An idea of the size of the challenge of implementing an eco-efficiency culture in the nation's smaller companies can be gleaned from the most recent survey from the Brazilian Industry Competitiveness Report, according to which 57.5% of micro-companies have not adopted any form of environmental management whatsoever, while, among the larger companies, this percentage has fallen to a mere 5%.

In order to overcome Brazil's difficulties in this area – namely, territorial vastness with sparse resources available for investment – it has become a matter of urgency to deepen partnerships between companies and government. One instrument capable of giving momentum to this process is the Inter-institutional Group for Cleaner Production created by the Federal Government as a reflection of the political commitment assumed by the Ministry of the Environment.

Today, there can be no more doubt. The eco-efficiency strategy means increased competitiveness, better environmental management and better relations with interest groups, the media and environmental control agencies.

## Guaranteeing survival

Whether from the social point of view or from the environmental point of view, the so-called modern world – the period following upon the Industrial Revolution – has not been able to overcome its stiffest challenges. Quite the contrary.

In terms of distribution of wealth, the current situation is unacceptable. According to the World Bank, the world today is 78% poor (people with an annual per capita income of less than US\$ 3,470), with 11% in the middle-income bracket and 11% classified as rich (annual per capita income of more than US\$ 8,000). This means that the richest 50 million earn as much as the poorest 2.7 billion.

Damage in the environmental sphere is also extremely evident. The current use of ecosystems has led to their decreased productive capacity. There are, today, 26,000 endangered species of plant, 1,100 species of mammal, 1,200 species of bird and 700 species of freshwater fish. One sad example of predatory use was the extinction of the sardine on the coastline of Rio de Janeiro state.

In the short term, we have to work towards reaching the Millennium Development Goals set for 2015. However, if we are to deliver on the present and future agendas drawn up by the large international conventions with a focus on sustainable development, we should look for inspiration to the statements and results in the final report of the Millennium Ecosystem Assessment, available at [www.MAWeb.org](http://www.MAWeb.org).

The report does not allow us to forget that “Everyone, everywhere in the world, depends on nature and the services provided by the ecosystems in order to lead a decent, healthy and safe life”. However, it is precisely we human beings who are responsible for the degradation of those ecosystems due to our needs for foodstuffs, water, fibres and energy. Although this drive has resulted in better quality of life for billions of people, the alterations it has wrought have weakened the ecosystems’ capacity to provide other fundamental services, such as access to drinkable water. Anthropic alterations

have also provoked the extinction of many species that could, at some time in the future, be necessary to our well being.

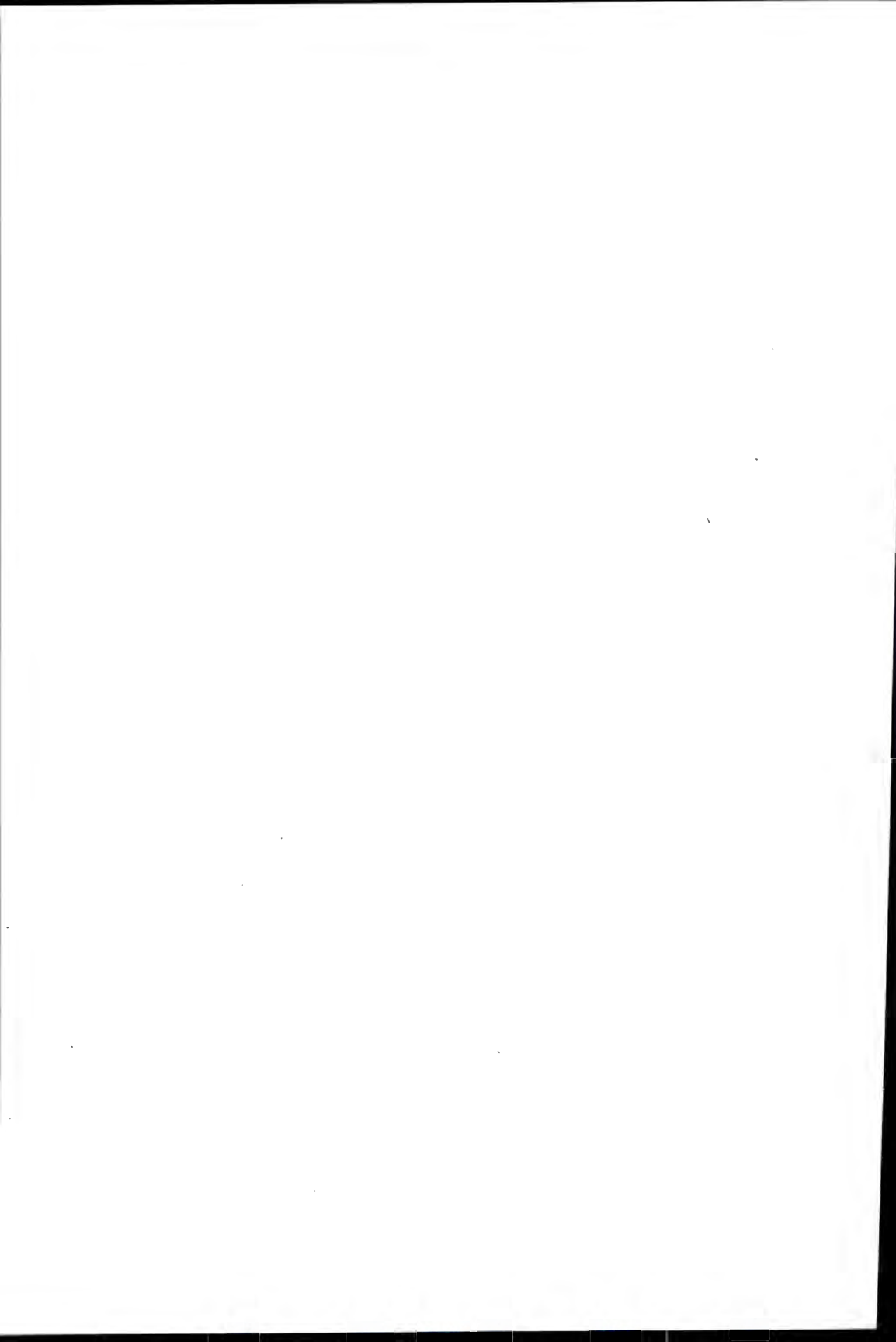
The report forecasts greater strain upon the ecosystems unless there is a change in human behaviour and a sharing of the responsibility among governments, companies and society in general, choosing the best policies for investment, commerce, subsidies, taxation and regulation.

We conclude by restating that partnerships and relationship networks are efficient ways of exchanging experiences and information and of complementing each other's visions and abilities. Sustainability requires a new posture of society. Ethics, transparency, multi-sectorial dialogue and tolerance are prerequisites to guarantee the credibility and survival of companies in a world that is demanding socially and environmentally responsible forms of conduct.



Wide-eyed  
and open-hearted





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# The difficult task of explaining knowledge and guaranteeing informed participation

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João Neves and Luciene Pohl<sup>66</sup>

*“What is preservation for us? Is it knowing? Is it having a database? Is it more research into this knowledge? Does preserving mean ignoring or respecting these cultures? What is it that the indigenous communities want? I think what they want is simply respect for who they are and for the knowledge they have. (...) We, as an indigenous movement, defend respect for our knowledge and not the exploitation of our knowledge”*  
*The words of Bonifácio Jose, Baniwa Leader, during a debate on the theme.*

This article aims to show that traditional knowledge is part of the cultural heritage of various peoples and that it ought to be protected and valued, with special mechanisms created to guarantee its manifestation in accordance with the standards conceived for it by each culture.

## A way of understanding traditional knowledge

Traditional knowledge has been the subject of intense discussion and frustrated attempts at definition, as it is practically impossible

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for any one concept to encompass all of the dimensions that have some direct bearing on the theme. However, there are some aspects that ought to be considered.

The point of departure when thinking about traditional knowledge is the understanding that we, members of the so-called indigenous and traditional populations, have an ample concept of nature that includes and interrelates the human being, fauna and flora, and provides the basis from which we develop our own technologies, systems and uses in accordance with our specific cultures.

The knowledge we have of the world is rooted in our traditions, careful observation and use of the processes and resources around us. Our myths, rituals, stories and practices represent and express the dynamic relationship between nature and society.

Nature can be valued, and is valued; but our criteria are differentiated and vary depending on the conditions that prevail and on the state of interaction between the various fauna, flora, human, non-human, climatic or cosmological factors, among other determinants. We also have certain entities or spirits that regulate the application of knowledge. Consequently, these entities also require norms or regulations in order to be perceived, represented, used and interrelated. This role often does not necessarily have to be performed by the specialists or traditional wise men, as this knowledge is not only present in rituals or festivals, but also in the day-to-day act of maintaining good relations with the hunted animal that is about to serve as food for the family.

For many indigenous peoples there are other rational species, species that think; and so, by extension, there are also people who intermediate between the different languages of these rational animals, sometimes through dreams or in some other form.

But all these relations can only express themselves and occur in a concrete territory, in an environment that contemplates all of these forms of manifestation – of the plantation, the chestnut grove, the waterfall, even in the places where the living complete their missions. This is why agrarian regularization is so important to the indigenous peoples.

Traditional knowledge is also a form of inheritance passed down through various generations, which underscores its collective condition.



It is the responsibility of the entire people to ensure the continuation of these traditions, even if not everyone knows everything. The mission of perpetuating the existence of this knowledge is incumbent upon each "heir".

In relation to the species in nature, which have functions and so can be considered useful, they may be transformed and used so long as their permission is requested from the relevant authority – the owner of the spirit. The solicitation of such permission often requires the intervention of a specialist.

Another very important aspect to consider is that we have specific forms of protection for this knowledge: first and foremost because knowledge has a value in itself; secondly, because it is the fruit of observation, experimentation and practices accumulated over generations; and, finally, because it is structured and arises in accordance with the social organization of each people, which determines what may or may not be revealed and to whom it may or may not be transmitted.

Ever since Pre-Columbian contact between European and American societies, indigenous knowledge has been appropriated, used and devalued. Potato and corn, for example, saved thousands of European lives, but due recognition of this fact has still not been given.

Our forms of classification are also greatly important for their potential to provide elements that could contribute to solving the problems of non-indigenous science, as there is an untold number of species as yet not systematised by this science.

There are regions in which countless variations of cassava co-exist, some of which are used to make flour, others for a range of different foods and even some that are used specifically to prepare and brew traditional drinks.

In other words, to make a plantation you need to have ample traditional knowledge, which entails certain activities that must be carried out systematically, as much to produce elements of knowledge as to maintain them, otherwise there is the possibility of the knowledge lacking continuity and being lost.

In order to guarantee the continuity of traditional knowledge it is necessary to protect not only its fragments, but also the nature/

people relationship and the factors that comprise it, as only thus can the order of things be preserved and the structure maintained.

## What should be done with the knowledge?

The problems arise when government organs implement public policies that run counter to our traditions.

Take, for example, the technical assistance provided to the so-called rural zones. In the Amazon, there is a deep-rooted tradition in subsistence agriculture that rests upon abundant traditional knowledge, and yet the organs responsible for the so-called development of agricultural activities end up subjugating that traditional knowledge by imposing the use of agro-chemicals and different seeds.

To support this approach, they cite market demands for agricultural produce and the benefits and superiority of their technique over our more traditional practices.

There are countless other examples. In the Upper-Solimões River, the fact that the government (through a Development Agency) was financing the sowing of plantations measured out in hectares caused one indigenous leader some consternation. Traditionally, no-one in the region had the habit of using measurements when planting, much less of requiring funding from banks in order to supply the families with cassava, part of the staple base of the diet in these communities. Nor did the program consider that the plantations are part of the families' work and of the relationship of exchange they maintain with other communities, whether in obtaining seedlings or seeds or in the mutual assistance that constitutes the basis of solidarity among neighbours.

In another region, the State's initiative was to plant watermelon using a type of seed that would not be reproduced after the first generation. The technical assistance completely ignored all of the fructiferous varieties and possibilities available in the locality.

The practice is much the same throughout almost the entire Amazon, although today there is some "timid" recognition on the

part of the government and its legislation of the fact that the indigenous peoples and traditional communities have, over time, been adapting and enriching nature. Brazil's ratification of the International Labour Organisation's Convention 169 was an example of this. This international treaty guarantees our cultural rights and participation in matters that concern us or that may come to affect us. However, its implementation will still require a great deal of struggle on the part of the interested peoples.

The government's difficulty in this implementation can be observed when we analyse the discussions on the theme of traditional knowledge. Our knowledge is currently being treated only partially, that is, as associated with biodiversity and especially genetic resources. To be crystal clear, as we see it, part of our knowledge, a piece of our culture, has become the target of legislation.

The Brazilian government signed the commitment to comply with the Convention on Biological Diversity, which deals with the sustainable use of resources and the fair and equitable sharing of the benefits of the use of genetic resources. As such, the government ought to be promoting ways to implement Article 8 of the Convention, which stipulates that Subject to its national legislation [each Contracting Party shall] respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices, and encourage the equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices.

As a participation mechanism, a Genetic Heritage Management Council was created within the Secretariat for Biodiversity and Forests of the Ministry of the Environment. This Council is responsible for coordinating policies concerning the management of genetic heritage and has the powers to deliberate on the granting of access to relevant natural resources.

The composition established for the Council prescribed the participation of government representatives only. In the face of this decision,

indigenous groups and civil society pressed for broader participation, which resulted in the "concession" of inviting representatives from these groups to participate in the meetings, but without holding the right to vote.

The problem is further aggravated when the discussions are centralized at decision-making levels and there are no mechanisms in place for the greater participation of all those who possess the traditional knowledge associated with the genetic resources in question.

Greater participation means having an effective role in the Council, with parity and the right to vote. But it also means promoting a broader understanding of the matters at issue, translating the course by which this demand has come to present itself today, both to the government and to the indigenous peoples and traditional communities. It is opportune to recall that this demand originated in a society ruled by capitalist interests, where there are strong pressures from formidable economic groups.

The participation of the parties with the greatest interest, the indigenous peoples and the traditional communities, consequently becomes less than representative, rendering unviable a more significant contribution on behalf of these peoples. Traditional knowledge thus becomes the theme of forums and debates for decision-makers who set regulations and norms, which, in turn, come to directly affect our lives. These forums and debates ought to be accessible to and incorporated by the communities so that they can present their own proposals.

This gives an idea of the difficulties inherent in the construction of an intercultural dialogue in which differences are respected and all voices are heard so that agreements can be reached.

## Indigenous participation in decision-making processes – the role of the movement

The Amazonian indigenous movement has, over the last 15 years, been trying to develop forums in which indigenous people can be heard. That's why the objectives of the *Coordenação das Organizações Indígenas da Amazônia Brasileira* – Coiab (Coordination of Indigenous

Organizations of the Brazilian Amazon) include encouraging and promoting an understanding of the true value of the cultural traditions of the indigenous peoples; strengthening their autonomy; promoting their coordinated and unified social, cultural, economic and political organization; supporting the preservation of the environment; maintaining partnerships to guarantee the defence of indigenous rights; and even promoting the formation of indigenous staffs.

The achievements have been considerable. Large swathes of our territory have not only been demarcated, but also regularised. Indians have managed to win new space in national society and have fought for more rights and against the difficulties that stand in the way of the advancement of our mission to articulate diverse voices.

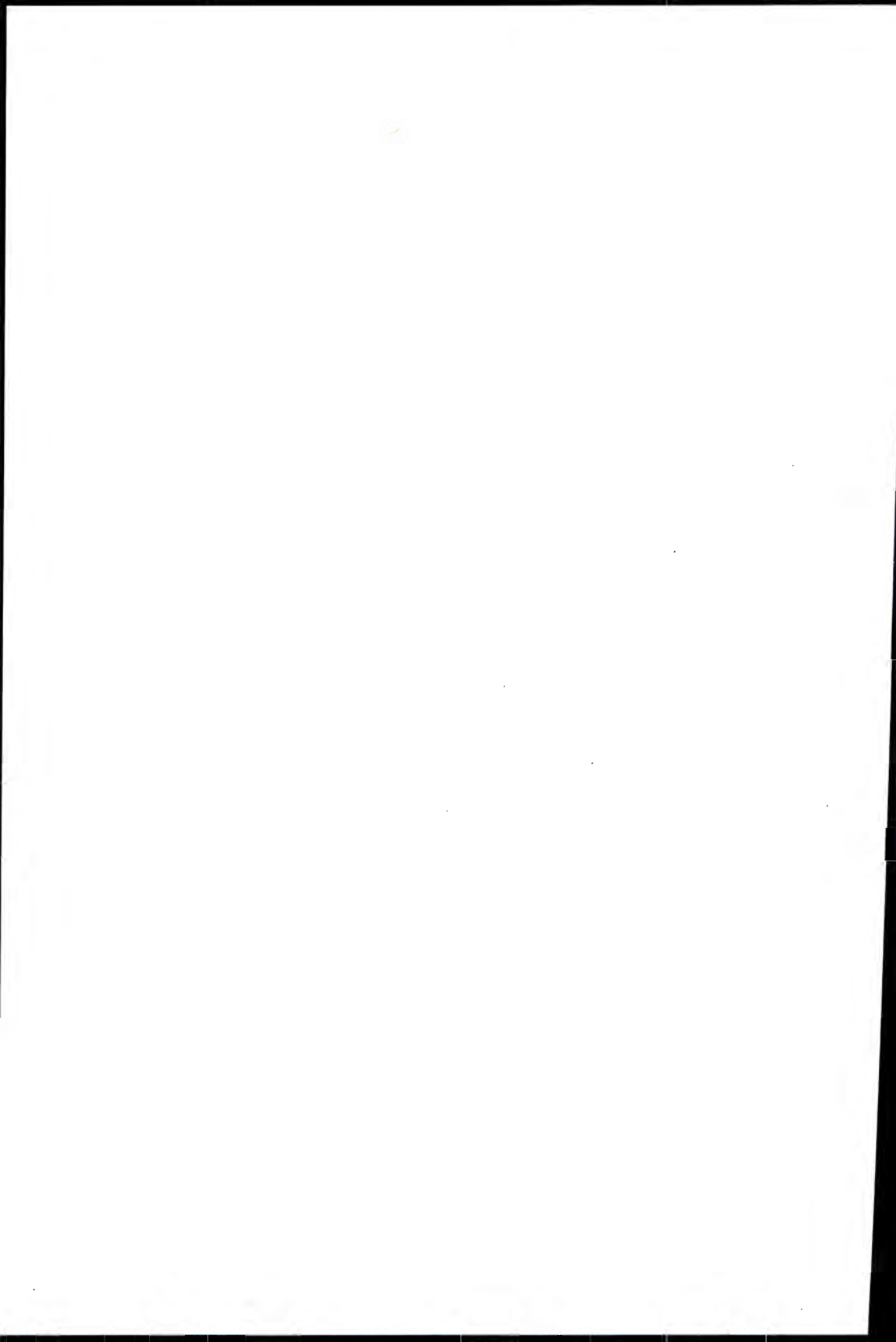
While some indigenous demands have been met by the government through environmental programs, and even though we now have an Indigenous health service with its own specific budget, there is still a long way to go before the guarantee of indigenous rights meets expectations and is put into practice.

The indigenous peoples are not interested in "concessions" from the government, on the contrary, we fight for the implementation of our rights and for respect for indigenous achievements and for the cultural plurality of the country.

As opposed to selecting one element, taking it in isolation and attributing greater importance or economic value to it, thus severing its link with the social and cultural context, it is important that our knowledge be understood and respected in a more integral manner.

This is the way we believe it will be possible to secure and seek more support for the manifestation of these peoples and communities, while promoting, valuing and ensuring the survival of their technologies, medicines, knowledge of fauna and flora, oral tradition, arts and integrated lifestyles.

Respect means promoting the means by which the traditional knowledge associated with the maintenance of our territories can be valued and made manifest while considering our beliefs and recognising our traditions.



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# The role of the Brazilian indigenous peoples in the implementation of the CBD

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Lucia Fernanda Jófej – Kaingáng

In 1966, through Article 27 of the International Covenant on Civil and Political Rights<sup>67</sup> the first demands for rights by indigenous peoples, in the capacity of minorities, began to emerge on the world scene, establishing a counterweight to the classic line of thought that the Universal Declaration of Human Rights of 1948 “would be capable of guaranteeing rights for all human beings, on an equal footing, regardless of gender, nationality, religion or ethnicity” (Norway, 2005, p. 5). Nevertheless, it was only from the 1980s on that the United Nations – UN – began to pay attention to the need to protect the human rights of indigenous peoples in the light of their socio-cultural specificities<sup>68</sup>.

In syntony with the advances occurring globally, the *Constituição da República Federativa do Brasil* (Constitution of the Federative Republic of Brazil), published in 1988, inaugurated a new paradigm in the legislative treatment historically dispensed to indigenous peoples insofar as it surpassed the misconception that the need for special legislative protection for indigenous society stemmed from the incapacity

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67. Article 27 of the International Covenant on Civil and Political Rights of 1966: “In those States in which ethnic, religious or linguistic minorities exist, persons belonging to such minorities shall not be denied the right, in community with the other members of their group, to enjoy their own culture, to profess and practice their own religion, or to use their own language”.

68. “With the creation of the Working Group on Indigenous Populations (WGIP) in 1982, the UN began its first formal effort directed towards indigenous peoples. Since then there have been expressive advances in the area of indigenous issues”.



of these minorities to practice the actions of civil life, an understanding that had hitherto juridically sustained the Brazilian government's use of the institution of guardianship<sup>69</sup> to the detriment of the indigenous peoples of Brazil.

Manuela Carneiro da Cunha & Nádia Farage, 1987, p. 113-114, teach us that "... it had tragic effects at the time of the discussions on the Civil Code, at the beginning of the 20<sup>th</sup> Century. This was a time of naïve and wide-reaching evolutionism that wanted to see in Stateless societies the "infantile" state of complex societies".

After centuries of inadequate legal treatment set down in juridical measures whose guiding premises consisted in a Eurocentric approach to the issue of the indigenous peoples, characterized as being possessors of inferior cultures that would disappear in contact with the supposed superiority of civil society after the European template, the Federal Constitution of 1988 put an end to the integrationist paradigm and gave rise to a new era of interaction between indigenous peoples and the Brazilian state, guided by the respect for diversity through recognition of the plurality of culture and the guarantee of special protection for indigenous minorities.

By recognising that the need for special legal protection resides not in civil incapacity, but in cultural diversity, the current Federal Constitution deals with the rights of indigenous peoples in a fuller and more innovative way, one that made it possible to develop, in the years that followed, ample indigenist infra-constitutional legislation for the protection of the rights of ethnic, linguistic and cultural minorities without infringing on their prerogatives as Brazilian citizens.

Based on this reaffirmation of their differentiated cultural identities and fruit of the need for greater integration of indigenous peoples in discussions affecting traditional knowledge, painting, song, dance, prayer, arts and crafts and other expressions that comprise

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69. Article 6, III of the Civil Code of 1916 (Law 3071) prescribed that the savages [*silvícolas*, defined here as indigenous, aboriginal or primitive peoples] were truly incapable of practicing certain acts of civil life. Later, in Law 4,121 of 1962 a single paragraph was added to Article 6: "The savages shall remain subject to the regime of guardianship established in laws and regulations, though this shall cease to apply as they adapt to the Country's civilization".

the Cultural Heritage of Brazilian Indigenous Societies, Inbrapi – *Instituto Indígena Brasileiro para Propriedade Intelectual* (Brazilian Indigenous Institute for Intellectual Property) was formed in June 2002, endorsed by dozens of indigenous organizations from various regions of the country as a response to nearly two years of consultations with the indigenous public as per the need to create an institute exclusively dedicated to the protection of Brazilian Indigenous Cultural Heritage and which could serve as a reference for Indigenous Peoples and Organizations, forming and informing indigenous professionals and traditional leaders with a view to securing, in a gradual and qualitative manner, their greater participation as new social protagonists.

The emergence of Inbrapi generated expectations and speculations about its objectives, especially given the use of the term “intellectual property” in the institution’s name. Inbrapi became an affiliate of the Instituto Nacional da Propriedade Intelectual (National Intellectual Property Institute) as an indigenous organization created to defend the adoption of intellectual property mechanisms as a means of protecting Brazilian Indigenous Cultural Heritage. However, over time, the Institute has made it clear that its activities are not couched in external interests, but wholly in the demands and expectations of the Indigenous Peoples, distinct as they are, in function of the cultural diversity that makes Brazil such a multicultural, or indeed ‘megasociodiverse’ country.

As such, Inbrapi has devoted itself to promoting the defence of the cultural specificities of Brazil’s Indigenous Peoples, based on the national and global legal outline for Indigenous Rights, by conducting an indispensable information interchange amongst communities, villages and local and regional organizations and national and international forums with focus on respect for Indigenous Cultural Patrimony.

In exercising its functions, the Brazilian Indigenous Institute often serves as a bridge between worlds with completely different outlooks and languages and it has come to understand that in the construction and implementation of fair and efficient natural resource management policies that respect the customs, practices and innovations of the Indigenous Peoples and Local Communities, as well as their traditional

ways of using biodiversity, it is indispensable that dialogue and respect for differences constitute the premises of all interaction between the social agents present at the macro level of decisions regarding the future of relations between indigenous peoples and all other national institutions, whether governmental or otherwise.

Inbrapi's participation in the hard-fought debates at the heart of the Brazilian government regarding the integration of the Convention on Biological Diversity – CBD<sup>70</sup> into national law and the constant pressure applied by some of the participating governmental segments in an attempt to lay siege to certain indigenous rights recognised under national law and in international treaties of which Brazil is a signatory, have left painfully clear the urgency and relevance of involving a more significant number of Brazilian indigenous organizations in the discussions on the CBD. With this in mind, Inbrapi has devoted much of its time to information campaigns (using both formal and alternative communication channels) targeting settlements and associations, and the formation of indigenous multipliers to promote similar efforts with traditional organizations and leaders in order to secure their proactivity in discussions on the Convention on Biological Diversity, the most important multilateral treaty on the environment to emerge in recent times.

The Convention on Biological Diversity – CBD resulted from the 2<sup>nd</sup> United Nations Earth Summit on the Environment and Development (Eco-92) held in Rio de Janeiro in 1992. The summit was the occasion for the creation of various international documents that today guide public social policy worldwide in the sphere of Environmental Law, such as Agenda 21, the Rio de Janeiro Declaration on the Environment and Development, the Declaration of Principles for a Global Consensus on the Management, Conservation and Sustainable Development of All Forest Types and the Framework Convention on Climate Change, among others. (Santilli, 2005).

70. Brazil ratified the CBD in 1994 through Legislative Decree nº 2 and it is currently regulated under Provisory Measure 2,186 of 2001. Discussions are underway on a Bill of Law to replace the Provisory Measure, thus fine tuning Brazilian legislation on the access to genetic resources and associated traditional forms of knowledge.

Eco-92 saw the emergence of new social protagonists on the global scene engaged in discussing biodiversity. The endeavours and articulation of the some 700 representatives of indigenous peoples drawn from five continents in attendance resulted in such documents as the Earth Letter and the Kari-Oca Declaration, which constitute historical landmarks for indigenous peoples in achieving social advances in the area of biodiversity and were decisive factors in the Convention on Biological Diversity's recognition of the relevance of indigenous peoples and their knowledge, innovations and practices to the conservation and sustainable use of biodiversity and the importance of respecting, preserving and maintaining them, in compliance with national legislation, as set out in Article 8, item "j" of the Convention.

The Convention on Biological Diversity expressly establishes respect for other international instruments, thus cementing a directive for a transdisciplinary approach to the protection of biodiversity that is capable of raising for discussion such themes as, on the one hand, the treatment given to traditional bodies of knowledge by the international intellectual property system and, on the other, the recognised rights of indigenous peoples over their cultural property and traditional territories, which necessarily also encompasses the natural resources contained in those lands and waters.

Thus, article 22 of the CBD<sup>71</sup> creates the need to establish dialogue with other agreements, thereby confronting international instruments that generate often conflicting rights and obligations. In this sense, Inbrapi, in its capacity as a Brazilian indigenous organization, has worked towards impressing upon the CBD the importance of taking into consideration the content of Convention 169 concerning tribal and indigenous peoples in independent countries established by the International Labour Organisation in 1989. Brazil ratified this convention in 2002 through Legislative Decree 143. On the other hand, some international treaties, such as the World Trade Organisation's Trade

71. Article 22 of the CBD establishes that its provisions "shall not affect the rights and obligations of any Contracting Party deriving from any existing international agreement, except where the exercise of those rights and obligations would cause a serious damage or threat to biological diversity".

Related Intellectual Property Rights Accord – Trips, of which Brazil is also a signatory, have been damaging to the Cultural Patrimony of Indigenous Peoples, principally when it comes to patent law.

Clearly, dialogue between the CBD and correlate international treaties is one of the biggest challenges faced by the implementation of the Convention and the social progress it aims to lever. No less complex, however, is the process of regulating CBD implementation in national law, which, in Brazil, is the responsibility of the *Conselho de Gestão do Patrimônio Genético* – CGEN (Council for the Administration and Management of Genetic Heritage)<sup>72</sup>.

The CGEN is currently and perceptibly polarised by a clash of divergent forces and interests; the representatives from the Ministries of Science & Technology, Agriculture & Industry and Trade, allied with guest members from civil society representing industry and research institutions, find themselves opposed by a minority group defending the need for special protection in terms of access to the traditional knowledge of indigenous peoples and local communities and advocating the establishment of clear procedures for the granting of prior informed consent and for the sharing of benefits in a fair and equitable way, as outlined in Article 8, item “j”, and Article 15 of the CBD<sup>73</sup>. This second group possesses only the right to speak, but not to vote, and is made up of representatives from non-governmental organisations (NGOs) protecting the interests of environmentalists, indigenous peoples, the descendants of slave communities and local communities, though these are frequently absent because

72. The CGEN is a collegiate organisation, of a deliberative and normative character, instituted by the Ministry of the Environment in Article 10 of Provisional Measure 2,186 of 2001. The CGEN is comprised, in the majority, of representatives from governmental ministries, who have the right to both speak and vote, and of representatives from civil society, research institutions, local communities, indigenous peoples, slave descendants and non-governmental organizations, who have the right to speak, but not to vote.

73. The CBD, in Article 8, item “j”, cites the importance of the practices, knowledge, traditions and innovations of indigenous peoples and local communities for the preservation and conservation of biodiversity, while Article 15 stipulates that access to genetic resources shall be subject to prior informed consent and establishes the need for sharing in a fair and equitable way the results of research and development and the benefits arising from the commercial and other utilization of genetic resources with the Contracting Party providing those resources.



they lack the financial resources to travel to the CGEN meetings, which are normally held in Brasília.

In this collision of forces, it is the position of the Ministries that has prevailed, as they hold the right to vote, comprise the majority on the Council and use their supremacy to impose criteria and procedures that serve to facilitate access to genetic resources and that allow for bio-prospecting<sup>74</sup>. By ignoring the continued protests of the representatives of indigenous peoples, the descendants of slave communities and local communities, who, supported by environmentalist NGOs, demand guaranteed and specific procedures to protect the genetic resources associated with their traditional knowledge, the CGEN is in flagrant violation of the principles of valuing and protecting the harbourers of traditional knowledge systems extolled by the CBD.

Within the forum of the CGEN, Inbrapi has defended the need for special treatment when it comes to access to genetic resources located on land occupied by indigenous peoples or local communities. This is based on the consensus among indigenous peoples that the associated traditional knowledge is an intrinsic component of any genetic resource found on indigenous or local community land and must therefore be protected as such under law. Daniel Munduruku<sup>75</sup> expresses the view of the indigenous peoples when he says: "we do not dissociate the natural resources that exist in our territories from the traditional knowledge of the medicine men. For us, the indigenous peoples, you cannot separate the song from the dance, the dance from the prayer, the herb from the cure...".

Nonetheless, the motions enacted by the indigenous organizations represented at CGEN meetings, despite having the respect for and protection of their cultural diversity and its particularities ensured under the order of national law and through multilateral treaties

74. Article 7, item VII of Provisional Measure 2,186 of 2001 defines bio-prospecting as "any exploration activity that envisages the identification of a component of genetic heritage, and information regarding associated traditional knowledge, for the purposes of potential commercial use".

75. Daniel Monteiro Costa, an indigenous philosopher and writer from the Munduruku people of Southern Pará, is the current Director President of Inbrapi.

ratified by Brazil, have been disconsidered under the justification of the most diverse arguments, ranging from the affirmation that indigenous peoples and local communities are creating obstacles to research and development in the country by demanding special treatment, to aspersions cast upon the legitimacy of the organizations representing the viewpoint of the indigenous peoples and local communities participating in the creation of a law under whose domain their societies would be the chief benefactors or victims.

In an attempt to dispel the manifestations and demands of the indigenous organisations, the representatives of the ministries have alleged the complexity and impossibility of adopting procedures for obtaining prior informed consent and the difficulty in identifying the rights owner(s) in cases involving associated traditional knowledge, as well as the costs following these procedures would represent for researchers. In addition, they also allege that the establishment of special procedures for access to, and the bio-prospecting of, genetic resources located in indigenous or local community lands would serve to discourage scientific research in those areas.

In response to these claims, the representatives of indigenous peoples and local communities have said they are aware of the costs the establishment of a series of prerequisites for access to the traditional knowledge associated with genetic resources would involve, but that they are willing to assume the risk and argue for the need for legal measures to guarantee respect for the cultural and social aspects and for the forms of use and publication of the information these societies possess. They also remind the CGEN that the CBD emphasises the need to respect, preserve and maintain these knowledge systems, innovations and practices, something that can only be done through special legal protection.

As a way of demonstrating the viability of creating procedures for the division of benefits in cases of traditional knowledge shared amongst different indigenous peoples, Inbrapi has also proposed the creation of ethno-regions<sup>76</sup>, a concept whose main proposition is to

76. Ethno-region case studies are currently underway in the Amazon region in order to verify their viability.



aggregate and cross-reference existing information on phyto-physiognomy, catchment basins, the mapping of indigenous lands and the incidence of linguistic trunks in each region of the country and use that information in addition to more specific existing sources of data to identify rights holders with enough precision to be able to draft contracts for the use and sharing of benefits.

Contrary to what the CGEN has affirmed in this regard, indigenous peoples are interested in researching and developing new technologies based on traditional knowledge, but in return, they demand that the national government, research institutes and the private sector, represented by food, pharmaceutical, cosmetic and phytotherapeutic companies, respect the cultures and particular time of each people, as well as the beliefs, values and traditions behind the special relationship they maintain with nature. They also hope that their traditional knowledge systems be recognised by science, as they are important to its progress, and, above all, they hope for respect for the legal systems of each indigenous people and local community, because the ancestral knowledge of these societies teaches us that laws do not have to be written down in order to be known and respected, for they are written in the heart of the universe, and ignoring them has come at a price payable over various lifetimes.

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# The contribution of *Centro de Referência em Informação Ambiental* (Cria)

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(Environmental Information Reference Centre)  
in the construction of a shared data  
infrastructure on Brazilian biodiversity

Vanderlei Perez Canhos, Dora Ann Lange Canhos and Sidnei de Souza

## Introduction

Conciliating socioeconomic development with environmental preservation is no easy task. With the incorporation of recent advances in information and communication technologies, the development and implementation of strategies for sustainable development will, with increasing intensity, come to be based on information management. There is a growing demand for rapid response solutions to problems associated with the occurrence and distribution of biological species, such as impact studies on the release of transgenic organisms into the environment and the adoption of measures to contain and control invasive species and agricultural blights and plagues. Systematic approaches to supporting informed decisions will come to depend more and more on the access and integration to and of data available from disparate information sources and on the use of advanced computational tools in the analysis and spatial visualisation of data and in the development of impact and vulnerability scenarios.

Recent advances in the area of information and communication technology are making it possible for enormous quantities of non-sensitive data, generated through publicly funded research projects, to be shared and used in an open and dynamic way. The construction of this shared data infrastructure is enabling the consolidation of a new framework for the development of collaborative projects involving

research groups in different countries and regions across the globe. Such optimised data and information exchange is making a decisive contribution to advances in research and innovation in the environmental area. Stimulating the open and ample access to data will lead to the improved quality and productivity of scientific and technological systems on a global scale.

Despite the various environmental meetings, agreements and treaties celebrated among nations and supported by international organs, the most concrete signs of a reversal of tendencies is emerging from non-governmental organizations, local government, the private sector and even individuals. In spite of the relevance of the International Conventions and Treaties in shifting towards the paradigm of facing the environmental problem as a global one, the most important international environmental agreements find themselves stalled due to resistance from major economic powers – as with the US refusal to ratify the Kyoto Protocol – or through a lack of financial resources on the part of international organs.

Despite the advances that have come with the implementation of the Convention on Biological Diversity and the efforts of the government and civil society, the knowledge base on Brazilian biological diversity is still incipient and disaggregated. The existing information is disperse and, as a general rule, inaccessible. An enormous quantity of data is stored in traditional libraries (paper) or in non-integrated digital archives. We also have a considerable amount of information associated with samples (specimens) of biological material deposited in herbariums and zoological collections throughout the country and abroad. It is estimated that the natural history collections scattered about the globe together contain some 2.5 billion specimens. Each specimen is physical evidence of the occurrence of the organism at some time in the past and provides information on the historical and geographic presence of the species, as well as ecological and morphological details. When properly documented, registered observations on the collection and taxonomical study of surveyed flora and fauna and microbiota comprise a valuable source of data for the construction of environmental impact and vulnerability studies.

Centralised models and controlled access to information are quickly giving way to distributive and integrated networks that allow for the control of sensitive data at the source. Today, it is technically possible to integrate data from myriad information suppliers, including digital libraries, natural history museums, biological resource centres, meteorological forecast institutes and socioeconomic data sources. The change of paradigm that has come with advances in information and communication technology, associated with the globalisation of science and technology, will certainly radically change the way environmental knowledge is managed in the coming decade.

### *Centro de Referência em Informação Ambiental – Cria* (Environmental Information Reference Centre)

Cria's goal and strategy is the electronic dissemination of data and information as a tool for the organization of the country's scientific and technological community. Its specific niche is biological information of industrial and environmental interest and its aim is to use its operations to make a direct contribution to the conservation and rational and sustainable use of Brazilian biodiversity. A sustainable society is an informed society, in which the various different segments produce and have access to qualified information for use in formulating and deciding policy.

Cria was structured as a non-profit civil association in December 2000 and was classified as a Civil Society and Public Interest Organization (Oscip) in July 2002. Its goal is to use its place in the third sector to serve the public good, producing information systems and related tools of environmental interest for free and open access. In this, its network of articulations is perhaps its greatest asset.

The point of departure for Cria's activities is the presupposition that data and information generated with public funding are generally also of public interest and should therefore be more readily accessible. The environmental issue presents an incredible opportunity to integrate

knowledge and experience both locally and on a more global level. The solutions are not to be found in laboratories or boardrooms, nor are they restricted to certain locations. There are various different players, each with its own particular interests, that should be interacting with a view to reaching the most socially and environmentally just consensus possible. Essentially, the environmental issue rests upon the resolution of conflicts in which the socialisation of the access to information and knowledge plays a central role. Cria aims to contribute towards this by making scientific data and information easily accessible in a free and open manner via the Internet.

## Cria Projects

In the five years since its foundation, Cria, in partnership with various national and foreign institutions, has been participating in the execution of projects and the drafting of strategies that have resulted in the development of various information systems of free and open access (Table 1). Among the activities in which Cria has contributed, those associated with the Biota/Fapesp Program deserve special mention.

The Virtual Biodiversity Institute (*Instituto Virtual da Biodiversidade*), associated with the Biota Fapesp Program<sup>77</sup>, incorporates the recent advances in the area of biodiversity-specific IT. This initiative integrates data from more than 70 research projects (fauna, flora and microbiota) through interoperable information systems, such as SinBiota<sup>78</sup> and SpeciesLink<sup>79</sup>, developed through the adoption of internationally accepted standards and protocols and open-protocol free software. SinBiota supports the integration, synthesis and spatial visualization of data obtained through field studies. SinBiota is a centralized system that integrates data from projects related to the program with data from external information sources (national and

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77. <http://www.biota.org.br>.

78. <http://sinbiota.cria.org.br/atlas>.

79. <http://smlink.cria.org.br>.

international) dynamically via the Internet. The use of a standard form for the registration of data and the geo-codification (latitude and longitude) of the collection site are compulsory for all projects associated with the program. The Biota Atlas comprises the State of São Paulo's digital cartographical base, with associated environmental layers, including catchment basins, vegetal cover, highways, municipal limits and conservation areas. The SpeciesLink network integrates primary data on specimens in geographically disperse biological collections, in real time, using computational tools for the correction and visualization of more than 700 thousand items registered in collections associated with the program.

The geo-referenced information is of fundamental importance in defining strategies for the conservation and sustainable use of biodiversity. Nevertheless, there remain considerable gaps in our knowledge about the distribution of species in the principal Brazilian biomes. The use of computational tools for modelling species distribution makes it possible to choose the best targets for field studies and to identify the areas with the richest biology, as well as to delimit areas particularly rich in endangered or endemic species. It also allows for the identification of species that could be used in environmental recuperation projects, the assessment of the potential exposure to invasive species and the evaluation of the impact of climate change upon the biodiversity. The most commonly used methods for the predictive modelling of species are based on the ecological niche concept.

Cria, in collaboration with Inpe – *Instituto Nacional de Pesquisas Espaciais* (the National Institute of Space Research) and *Escola Politécnica da Universidade de São Paulo* (the São Paulo University Polytechnic School), is working on the development of a computational environment (OpenModeller<sup>80</sup>) that allows the user to combine data on the occurrence of a given species with the environmental characteristics of the location(s) of that occurrence so that algorithms can then be run to identify locations with similar environmental characteristics. Niche modelling defines the ecological limitations in

80. <http://openmodeller.sourceforge.net/>.



accordance with the dimensions specified for the generation of the model. This enables the user to project the distribution of a species within a given geographic range in order to forecast where species would be capable (or not) of maintaining the viability of their populations.

## Conclusion

Following the mould of the developed countries, the third sector in Brazil should play a prime role in developing mechanisms to catalyse the participation of the citizen in socioenvironmental issues, stimulating the involvement of society in the continuous revision of public policy and in exploring the opportunities the sustainable use of its natural heritage can offer to the nation. It is essential that these mechanisms ensure that the majority of the Brazilian population can reap the benefits of the appropriation of our natural resources through the construction and consolidation of a new model of economic development.

Technical, legal and cultural restrictions exist and need to be overcome. The challenges are stiff, but the opportunities are greater still. Recently, at the meeting "Science, Technology and Innovation in the 21<sup>st</sup> Century", organized by the Organization for Economic Cooperation and Development (OECD), ministers of the member states recognised the value of sharing data from publicly funded research. A coordinated effort (nationally and internationally) to broaden access to data obtained through research financed with public resources is fundamental.

Transforming information and knowledge into infrastructure for decision making and the formulation of public policy is an enormous challenge to the scientific community and public authorities. Transforming that same information into infrastructure for the exercise of citizenship is an even greater challenge, but, if successfully completed, will be a fundamental instrument capable of influencing current cultural processes.

**Table 1 – The main initiatives developed by Cria**

**Information systems:**



*The Virtual Biodiversity Institute:* information about the concept and strategy of the Biota/Fapesp Program, the projects associated with the program and instructions on how to submit a proposal within the scope of the program.



*SpeciesLink:* a distributed information system of data from biological collections and field studies. Also contains a number of tools for the visualization and correction of data.



*SinBiota:* environmental information system for the State of São Paulo developed to host data from inventories and surveys carried out by the projects linked to the Biota/Fapesp Program.



*SICol:* a system that integrates data from microbial collections developed with the support of the Ministry of Science and Technology.



*OBIS Brazil:* is one of the 3 sub-nodes (Argentina, Brazil and Chile) of the Ocean Biodiversity Information System – Obis in South America. The Brazilian component of the project, financed by the Alfred P. Sloan Foundation, involves the Zoology Department of the Biosciences Institute and the Department of Biological Oceanography of the Oceanographic Institute, both belonging to the University of São Paulo (USP), and Cria. The information to be made available includes data on benthic Biodiversity of the Brazilian Revizee Program.



*Biota Neotropica Journal:* an outlet for the Biota/Fapesp Program, this journal publishes the results of original research, taxonomical revisions and articles with a focus on the conservation and sustainable use of biodiversity in the Neotropics.





*Bioline International*: a non-profit electronic publishing service committed to promoting access to quality publications from developing countries. Managed by scientists and librarians in a cooperative effort between the University Libraries of Toronto, Canada; Bioline/UK and Cria, responsible for storing and managing databases.

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**Projects:**

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*OpenModeller*: a multi-platform computational environment for modelling the spatial distribution of species. Capable of working with various algorithms, OpenModeller can be used through programming interfaces, including C++, SOAP and SWIG-Python, as well as through compatible graphic interfaces.



*BioGeomancer*: an international collaboration involving specialists in natural history and geospatial data that aims to maximise the quality and quantity of biodiversity data that can be mapped as a supplement to research, planning, conservation and environmental management. The project, which involves a consortium of 18 international institutions, is coordinated by the Berkeley Museum of Comparative Zoology (University of California) and financed by the Gordon and Betty Moore Foundation, GBIF and National Science Foundation.



*DataTester*: an open-code software developed to assist in the detection of data errors in biological collections, is currently under development with the support from the Global Biodiversity Information Facility -GBIF and the Gordon and Betty Moore Foundation.



*incofish Project*: financed by the European Union and coordinated by the Leibniz Institut für Meereswissenschaften (Kiel, Germany), it involves 35 institutions from 22 countries (12 European, 12 Latin American, 6 Asian and 5 African). Cria's role will be to develop tools for species mapping.



## Strategies:

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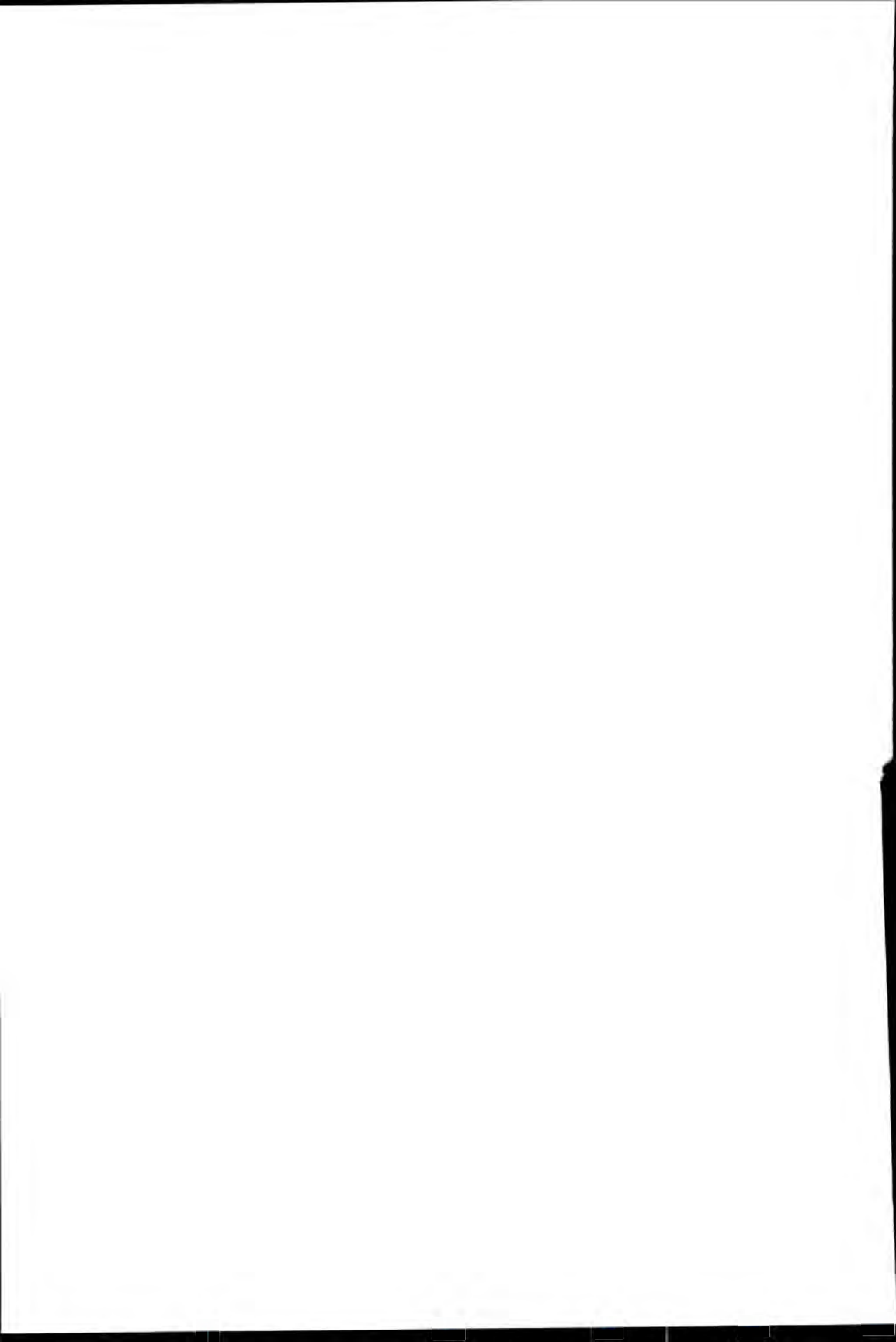
*Directives and Strategies for the Modernization of Brazilian Biological Collections and the Consolidation of Integrated Systems about Biodiversity:* a project developed with support from the Ministry of Science and Technology and the Centre for Management and Strategic Studies. The aim is to establish directives and strategies to improve Brazilian biological collections within a 10-year timeframe. It is being developed in strict collaboration between the Brazilian Botanical, Zoological and Microbiological societies.

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*Amazon Basin Biodiversity Information Facility – ABBIF:* a viability study for the establishment of an information infrastructure on the biodiversity of the Amazon Region. This study, financed by the Gordon and Betty Moore Foundation, is being developed by Cria in strict collaboration with the region's Global Biodiversity Information Facility (GBIF).

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# Communicating *Biodiversidade Brasil*

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Maria Zulmira de Souza

## Introduction

The word biodiversity was used for the first time in 1986 by the North American thinker and biologist E.O. Wilson, accepting the suggestion of the staff of the National Research Centre of the United States that the term was more effective in terms of communication than biological diversity, coined by fellow North American biologist Thomas Lovejoy in 1980<sup>81</sup>.

From the point of view of communication, it is a good job E.O. Wilson did accept the suggestion, as the word biodiversity has, in a relatively short span of time, attained a great deal of visibility. Though much remains to be done to make it truly a part of the daily lives of the people, some initiatives show that the approval of the Convention on Biological Diversity was a large step in this direction.

Biodiversity even became the title of a TV program on a national channel. On air since 2001, *Biodiversidade Brasil* (Biodiversity Brazil), on TV Cultura of São Paulo, is a one-of-a-kind partnership between this public TV channel and the company *Natura Cosméticos*

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81. Source: Wikipedia – A Enciclopédia Livre – <http://pt.wikipedia.org/wiki/Biodiversidade> (in Portuguese).

and is an effective contribution towards fulfilling Article 17 of the Convention on Biological Diversity, which deals with the exchange of information<sup>82</sup>.

## The partnership

TV Cultura of São Paulo is a public channel re-transmitted to every state in Brazil. The environment is one of the hallmarks of its programming. *Planeta Terra* (Planet Earth) was the channel's inaugural program back in 1969. This documentary showed earthquakes, volcanoes and the phenomena that occur in the depths of the planet. The program still goes out today, every Sunday, presented by Valéria Grillo, with her unmistakable voice, exploring the mysteries of nature<sup>83</sup>. Many children also acquire their first notions of ecology through the adventures of the characters in the award-winning series *Rá Tim Bum*.

The hosting of Rio-92 in Brazil created a favourable context in which to allot more space to environmental themes in the channel's programming. The program *Repórter Eco* (Eco Reporter), on air since February 1992, initially as a daily news feature and later as a weekly nature and wildlife documentary, sedimented this trend, which has since given rise to other shows as well. Today, in São Paulo, the program is broadcast at six thirty on Sunday evenings, though programming varies from state to state. The average audience ratings oscillate between 2 to 3 points (Ibope), which corresponds to an audience of some 450 thousand people in greater São Paulo – a loyal and varied public. This show is considered a national reference by

82. Article 17 – The Exchange of Information: “(1). The Contracting Parties shall facilitate the exchange of information, from all publicly available sources, relevant to the conservation and sustainable use of biological diversity, taking into account the special needs of developing countries. (2). Such exchange of information shall include exchange of results of technical, scientific and socioeconomic research, as well as information on training and surveying programmes, specialized knowledge, indigenous and traditional knowledge as such and in combination with the technologies referred to in Article 16, paragraph 1. It shall also, where feasible, include repatriation of information”.

83. Source: website ‘*Tudo Sobre TV*’ (Everything about TV) – [www.tudosobretv.com.br/histortv/tv60.htm](http://www.tudosobretv.com.br/histortv/tv60.htm) (in Portuguese).



TV viewers and critics alike. It is one of the few programs specialised in socioenvironmental themes anywhere in the world to have remained on air since Rio-92. Such is the program's importance that the production team is frequently invited to give speeches and lectures in Brazil and abroad.

While most television stations chose to give only superficial coverage to this fact of historic importance for planetary health, TV Cultura produced a daily news bulletin during Rio-92 and again during the Rio+10 meeting in Johannesburg in 2002, thus transforming the conferences into themes of the grandest order. Ours was the largest Brazilian TV crew ever sent to South Africa.

Natura is a leader in the cosmetics, hygiene and perfumery sector and its administration is based upon three pillars: the social, environmental and economic bases of society. It was the only Brazilian enterprise to rank among the world's 50 most efficient companies in the integration of financial, social and environmental information according to the list compiled by the English agency SustainAbility, in partnership with the United Nations Environment Program (Unep), in 2004. One of Natura's flagships is the Ekos product line, launched in 2001, which has the differential of incorporating active principles sustainably extracted from Brazilian biodiversity. Among these active principles is the "Breu Branco" resin used in its *Perfume do Brasil*. The use of "Breu Branco" resulted in only the second-ever Brazilian benefit-sharing process between a company and a traditional community, approved by the Genetic Heritage Management Council (CGEN) in 2004.

Prior to the partnership with Natura, biodiversity was already a theme of some emphasis on *Repórter Eco*, but not in TV Cultura's programming as a whole. The program's charisma and the respect it instilled were what enticed Natura to seal the partnership with the channel. *Biodiversidade Brasil* arose from the company's interest in sponsoring programs that could bring more visibility to themes related to Brazilian biological diversity allied with TV Cultura's openness to subjects in syntony with the principles of public journalism. The partners define the program as "a public forum for debate, reflection and the production of knowledge on Brazilian biodiversity and its sustainable uses".

## The project

The *Biodiversidade Brasil* project came under the Rouanet Law. The initial three-year contract foresaw the co-production of television programs and the formation of an image bank on biodiversity, as well as a joint effort to divulge the theme and bring it to the awareness of the Brazilian citizen. The first phase of the project (2001-2004) included the following programs:

- *Quadro Biodiversidade* (The Biodiversity Brief) – A weekly feature on the program 'Repórter Eco' dealing with themes related to Brazilian biodiversity.
- *Biodiversidade Debate* – A monthly debate program for discussion on the themes featured on *Repórter Eco*, with the participation of special guests, personalities from the environmental area and opinion formers.
- *Biodiversidade Documento* – A program from TV Cultura's Documentary Centre, co-produced with Natura, on the scientific, social, political and economic aspects of Brazilian biodiversity.
- The site [www.biodiversidadebrasil.com.br](http://www.biodiversidadebrasil.com.br) is also part of the project. This site contains the transcripts of the reports shown on TV Cultura, articles by specialists on the themes handled, as well as a glossary, events calendar and other information. Surveys and debate forums allow the user to give his or her opinion on the subjects discussed in the *Repórter Eco* briefs.

The project was renewed for three more years with emphasis on the *Repórter Eco* briefs and on the internationalisation of the products generated by the partnership.

A working group made up of representatives from Natura and TV Cultura meets periodically to discuss the direction of the project and the agenda of themes to be produced. In addition to the working group, there is also an Editing Council featuring representatives from the boards of directors of both institutions.

## Biodiversity on TV

All projects on television are the result of teamwork. It takes dozens of people to put a simple report on air for a matter of minutes. *Biodiversidade Brasil* is no different. This article will concentrate more specifically on the *Repórter Eco* briefs and *Biodiversidade Debate*, the two products of the partnership with which the author is most directly involved.

The selection of the theme for each biodiversity brief, followed by the discussions, research, production, editing and broadcasting amounts to a time-consuming process that takes a minimum of three months. Given the specificities of the project, each theme is discussed at meetings between TV Cultura and Natura.

The production team's biggest concern has always been to underline the seriousness of the program and its commitment to the precision of the content, demonstrating that it is possible to present scientific, social and economic aspects of the environment to large sections of the community by telling the stories of people or organizations who make a difference through their work and who inspire other initiatives in the area.

But just how do you present the most important issues related to Brazilian biodiversity to an essentially lay audience, no matter how interested it may be?

The first brief presented on *Repórter Eco*, in September 2001, is a good illustration of how the content was thought through and passed on to the viewer. The 'character' chosen for the debut program was the endangered tree palm: "guaricanga-do-brejo" (*Geonoma schottiana*). The summary below is from the project's site.

"The tree palm "guaricanga-do-brejo" is a delicate species whose survival depends on tree shade, high humidity and interaction with pollen-spreading insects. Birds, which feed on tree fruits and then spread the seeds, also play an important role in the complex web of relations between species that sustain the continuity of life. Found in the wetlands of the Atlantic Forest, like the Santa Genebra forest remnant in Campinas (São Paulo), the "guaricanga" is an endangered

species. Deforestation, pollution, the use of agrochemicals on plantations, acid rain and the hunting of animals are among the causes of the fast-diminishing occurrence of this example of Brazilian biodiversity. This palm is just one of the 1.5 to 2 million species of living things known to science worldwide. However, researchers estimate that this number could be much greater; anywhere from 20 to 100 million. Given the fact that it is home to 10% to 20% of all known life forms on the planet, Brazil is considered world number one in terms of megabiodiversity. In superior plants alone, those that produce flowers, fruits or seeds, Brazil has from 50 to 56 thousand species distributed throughout such biomes as the Atlantic Forest, Amazon Rainforest and Cerrado grasslands. There are more than 3 thousand species of freshwater fish and more than 500 species of mammal.”

And the report continues in this vein, reminding the viewer of the amplitude of the concept of biodiversity and that it has a bearing on the daily lives of the people, providing such basic things as the raw materials for our homes, fuels and foodstuffs, as well as maintaining the quality of the water.

This report by Cláudia Tavares was accompanied by images filmed in the palm's natural habitat and from the archives of the TV Cultura Documentation Centre and interviews with the biologist Alexandre de Souza and Maria Cecília Wey de Britto, then in charge of the Biodiversity Alliance SOS Atlantic Forest and Conservation International-Brazil.

It is important to observe how information transmitted via television often means synthesising into a presentation only a couple of minutes long knowledge that takes years, decades or even longer to systemise.

From the beginning of the production of the *Repórter Eco* briefs we saw that there was an ocean of possible subjects to be explored, extraordinarily interesting projects underway and a wealth of dormant potential ready to be brought to the knowledge of the public.

## Enchanting stories

We have lost count of how many thousands of kilometres have been covered the length and breadth of Brazil since production began on the stories for the *Biodiversidade Brasil* briefs. Practically every Brazilian state has had its biodiversity featured and all of the biomes were looked at, with research on medicinal plants, ethno-botany, essences and aromas, Brazilian flowers, among so many others. The National System of Conservation Units – Snuc – was discussed in four programs. That means Brazil's conservation units were the highlight of *Repórter Eco* and *Biodiversidade Brasil* for a period of four months, with reports on themes seldom seen on television, such as Brazilian primates, biological invasions, agro-forest systems, the relationship between rivers and biodiversity, the certification of forest, non-wood and organic products, the importance of partnerships for the conservation of biodiversity, Brazilian landscapes, the four elements and biodiversity... and the list goes on.

It would be difficult to choose the most important stories told during this period. They were all important, given the different realities and perspectives they expressed. We had the chance to get to know so many people and organizations that it would take much more than



Caatinga scrubland.



a chapter in a book to speak of them all. It is quite impressive how many projects and solutions have been put into practice in Brazil without ever being spoken of in the media or considered by Brazilian public policy.

The pace of production for a single travelling team to put out a series of 4 or 5 reports per month can only be described as intense. We often had to take in two or three different states, travelling kilometres on practically inexistent roads or in boats to record those emotive stories involving the most unique individuals.

The production of the Caatinga scrubland series was one of the team's most unforgettable adventures, taking in more than 1,500 kilometres along the roads of Pernambuco destroyed by the torrential rains that assailed the region in February 2004.

### *Caatinga, almost unknown*

The objective was to show this almost unknown biodiversity, the inhabitants and the uses they make of it and to present a green and flowery biome much in contrast to the customarily dry landscape of the region. We used to joke that we went ahead and the rain came behind.

It was in the region of Ouricuri, located in the Araripe Mountains in the Pernambucan bush, that we met Francisco (Chico) Macena, the man responsible for introducing the cement plate cisterns and one of the founders of the NGO Caatinga. Prior to the arrival of the cisterns in 1992, getting a simple glass of water to drink was an enormous challenge for the women of Francisco's family. They had to walk 2 km with a water can balanced on the crown of their heads. Francisco's wife, Antonia, tells how she always had to walk long distances, even when pregnant. "I used to get home with my belly as hard as a rock, but I had to do it or die of thirst".

Francisco can't write well, but he is good at maths. He developed a complex reasoning to show how the lack of water de-structured the bushland families. As he says himself: "This reckoning made me remember when I was a lad and I used to carry water back from way

off for my mother and how tired we used to get. Now I see my family carrying water back too. I said, I'm gonna make some calculations: how many steps do we have to take to walk a thousand metres? A woman has to take 15 thousand steps a day just to get five cans of water. Then I asked, how many steps is that a month? That's 450 thousand steps; 300 kms a month. And the time it takes? It's enough to finish with a family! When I'd added it all up I went to Caatinga with the result and the people at Caatinga took a look and said – you know... what we've got to work with is cisterns. They got so enthusiastic about it that to this day Caatinga still works with cisterns”.



Chico Macena in the Pernambucan bush.

Francisco's little property is greener than those of his neighbours, because he also learned that greenery and water are inseparable. "The water's here because the lush is here".

People like Francisco (or Chico) always help make a story more interesting and more engaging to the public, making the scientific information easier to understand. In the case of the Caatinga, there is still little information on the region and this contributes to a false idea that it is poor in biodiversity. The series featured the researchers Marcelo Tabarelli, from the Federal University of Pernambuco, and



José Siqueira, from the Federal University of the São Francisco Valley, who have produced studies that have dispelled the myth of a biologically poor biome by revealing its 930 species of seed-bearing plant, 510 species of bird, 210 species of fish and 143 species of mammal. “Considering the fact that the Caatinga is a dry forest, these numbers reveal an appreciable biological diversity”, says Marcelo Tabarelli.

The production of the series on the biodiversity of the state of Amapá, accompanied by an expedition from the Tumucumaque Mountains National Park, organized by Iepa – the Scientific and Technological Research Institute of Amapá, the Secretariat for the Environment and the NGO Conservation International-Brazil, was another benchmark in the history of the program. The reporting team made up of Teresa Cristina de Barros, Ronaldo Justino and Sandro Pereira had to do a lot more than simply face the challenges of keeping up with a scientific expedition in the Amazon Rainforest in order to learn about the biodiversity of the Tumucumaque Mountains National Park. Besides its pioneering spirit, the trip was marked by the difficulties caused by the drought the region suffered in 2005. With river levels lower than expected, the boats had to be pushed through more than 20 stretches of slow water. Wrecked equipment, overturned boats... the result deserves to be seen at the site: [www.tvcultura.com.br/reportereco](http://www.tvcultura.com.br/reportereco)

## Biodiversity debate

From October 2001 to July 2004, *Biodiversidade Debate* brought together the most expressive personalities connected with the theme in Brazil. Researchers and representatives from NGOs, companies and the government discussed the issues and proposed solutions. With 52 minutes’ duration, the program went on air at 6pm the first Sunday of each month. Presented by Maria Zulmira de Souza, the debates involved the participation of the journalist Washington Novaes and three guests.

For example, the guests for the debate on Indigenous Lands were Siridiwé Xavante, president of the Ideti – Institute for the Development of Indigenous Traditions; Sydney Possuelo, Head of the Isolated



Centre: Maria Zulmira de Souza. From left: Claudia Tavares, journalist at TV Cultura, Adalberto Veríssimo, from Imazon, Mario Mantovani from SOS Mata Atlântica, and Washington Novaes, environmental consultant to TV Cultura and the *Biodiversidade Brasil* project.

Indians Department at Funai (National Indian Foundation) and former president of the entity; and Marina Kahn, anthropologist and project coordinator at the ISA (Socioenvironmental Institute).

The audience had the chance to follow discussions like this:

*Siridiwé Xavante:* “As for the importance of biodiversity to the indigenous peoples, I would say we are the holders of the DNA of traditional knowledge, because we still manage, understand and respect our land, even if located on an island. Each people has its own memory and particular knowledge. The Guarani tribe knows more about the biodiversity of the Atlantic Forest than anyone else. My people, the Xavante, is the most knowledgeable about the Cerrado and Tropical Forest, located in the North of Brazil. If western science really cared about biodiversity and the Brazilian government sought ways to protect and know the riches of our nation, Brazil would really benefit a lot from that. We could export to the first world and so prevent them from exploiting our traditional knowledge.”

*Washington Novaes:* But if you introduce the goods of the white culture into the indigenous culture, you change that culture. There’s

no way around it. As soon as an Indian puts on a watch, he changes the way he lives. How do you face these contradictions?

*Siridiwé Xavante:* The older folk are investing heavily so that the generation that leaves the village comes back and uses the resources learned in your culture to contribute to our community.

*Maria Zulmira:* How does that work in practice, Siridiwé? What, for example, can you incorporate into your culture? I see you are wearing a watch. Up to what point does that affect your culture?

*Siridiwé Xavante:* Do all Brazilians have to drink *Guaraná*<sup>84</sup> instead of Coca-Cola, otherwise they'll all turn into Americans? If I can't wear a watch, that's a lack of free determination.

*Washington Novaes:* It's not that you can't [wear a watch]. What I'm saying is that it raises a contradiction.

*Siridiwé Xavante:* On the other hand, the civilization of the whites does not cultivate respect. Yes, we have to wear clothes. For the whites, a naked man or woman has connotations of obscenity. So, if we have contact with the white man, how can we continue to walk around naked? Another thing, our traditional ceramic is extremely heavy and doesn't last very long. An aluminium pan is lighter and lasts longer.

## Biodiversity at the bank and at the coffee shop

I think that one of the greatest rewards in working in communication is being able to make the most diverse audiences understand the content we are trying to get across. It is not always easy to couch

84. *Guaraná* is a popular Brazilian soft drink made from the fruit of the *Guaraná* plant native to the Amazon.

the themes of biodiversity in a language that is easy to understand. In the case of *Biodiversidade Brasil*, I know two viewers who offer great encouragement and function as ‘barometers’ of the work.

At the bank branch inside TV Cultura, Maria Babrauskas never misses a program and comments on all of the reports. She was extremely touched by Muriel Saragoussi’s affirmation – a researcher and director at Conama, the National Environment Council –, that a flight over the Amazon changed her outlook on life.

Having a coffee at Letícia’s deli in the west zone of São Paulo is not only a pleasure for its toast and delicious coffee. The counter attendant José Eudes is one of the most dedicated viewers of *Biodiversidade Brasil*. He watches every program and lets me know what he thought as soon as I arrive. Between one coffee and another, I asked:

– Zé, when we speak of biodiversity, what do you understand by the term?

– Well... bio is life...the diversity of life. Isn’t it?

## Awards

The partnership’s efforts to promote the importance of biodiversity has earned various important awards, such as:

- Best documentary – *O Primeiro Mundo é Aqui* (The First World Is Here) – Environmental Education category at the VIII Serra de Estrela International Festival of Environmental Cinema and Video in Portugal, 2002.
- Conservation Incentive of the Year Award, conferred by Ford and the NGO Conservation International (CI Brazil), in 2003.
- Eco Award – conferred by the American Chamber of Commerce – Amcham, in 2003.
- Award for Reports on the Biodiversity of the Atlantic Forest – Category: Television Alliance for the Conservation of the Atlantic Forest – for the documentary *Bioconexão – a vida em fragmentos* (Bioconnection, life in fragments). 2004.

## Results

From September 2001 to December 2005, the slot on *Repórter Eco* broadcast more than 280 6 to 8-minute reports. *Biodiversidade Debate* was on air from October 2001 to July 2004, running a total of 32 programs. *Biodiversidade Documento* produced eight documentaries, including: *O Primeiro Mundo é Aqui* (The First World Is Here) and *Cerrado Urgente* (Cerrado – Urgent), both directed by Washington Novaes, and *Biota*, a special series of four documentaries co-produced by the *Biodiversidade Brasil* project and *Canal Azul*.

The 1<sup>st</sup> *Biodiversidade Brasil* Documentary Competition, an initiative from TV Cultura and the company Natura, with support from the Ministry of the Environment, was held in 2004. The event attracted quite a lot of media coverage and submissions from independent producers from all over Brazil. The prize was R\$ 10,000.00 plus a co-production contract to the tune of R\$ 200,000.00. The winning script was *Bioconexão* (Bioconnection), which spoke of the risks of Atlantic Forest fragmentation. The documentary was produced by GW and directed by Fausto Fass, and involved consultancy from the journalist Liana John.

### A word from some of those involved

The partnership between TV Cultura and Natura is the result of the efforts of various professionals from the two institutions and is founded upon shared values that have led to a constructive dialogue between the public and the private, as can be seen from the evaluations of some of the people involved in the project:

*Washington Novaes – consultant on the Biodiversidade Brasil project and general supervisor of Repórter Eco*

“I would evaluate the project from three angles:

1. *Biodiversidade Debate* became a reference for the more specialised public and the scientific area;
2. The documentaries, so far, have made it possible to deal with certain biomes and issues, such as climate change, with more depth; and
3. *Repórter Eco*, with the biodiversity briefs, gives ample coverage to positive experiences and possibilities - something rare in the media.

Insofar as it so thoroughly presents and documents the most successful experiences involving the participation of traditional communities and the scientific community, it contributes to the implementation of the Convention on Biological Diversity. In addition, by bringing information to a wider public, it uses television to change the image of biodiversity, presenting it as an asset rather than as a problem. The project has helped reveal the possibilities that are open to Brazil as the holder of the world's greatest biodiversity.”

*Rodolfo Witzig Guttilla – Director of Corporate Issues at Natura*

“The *Biodiversidade Brasil* project is an innovative initiative. It is innovative insofar as it approaches an ample and complex theme that is so important to our collective future through a language that is accessible to the average viewer. It is also innovative in uniting the forces of a public TV channel, Cultura, and a private company, Natura, in producing knowledge and information. Finally, another innovative aspect is that it creates mechanisms for cooperation with the various different agents in the video production chain for high quality documentaries, as is the case with the documentary competition the *Biodiversidade Brasil* project promotes with support from the Ministry of the Environment”.

Marco Antonio Coelho Filho – Director of Expansion,  
Network and Documentaries at TV Cultura

“The *Biodiversidade Brasil* project brings a theme of strategic importance to the country and to the world into the public domain. For the first time ever in Brazil, a project has been formed through a partnership involving a public TV station, TV Cultura, and the capital of [a private company] Natura, an enterprise for this new age, in which capital has to be responsible in dealing with biodiversity, an issue of increasing strategic importance for humanity”.

Vera Diegoli – Chief Editor of *Repórter Eco*

“As a professional who has been involved in *Repórter Eco* from its creation in 1992 right up to its current format and content, I believe that the biodiversity slot is the natural achievement of a television program that has sought to perfect its divulgation of projects and actions for conservation and the sustainable use of natural resources.

*Repórter Eco* achieved more consistency by including a special feature on this enormous heritage Brazil has in terms of the richness and diversity of its forms of life.

Our biggest challenge is to fine tune the language of the program so that the special reports become accessible to a greater number of people as yet unaware of the importance of researching and maintaining this potential for economic, social and environmental development that is our biodiversity”.

## Considerations

Transforming biodiversity into a theme accessible to the viewers of a public channel remains a challenge even 5 years into the project. There is no lack of agenda. It is a world open to discovery, starting with the multiple aspects of the theme, the innumerable projects of scientists and communities underway, the legal issues, the threats and



so many other dimensions that open up when you start to look deeply into the question.

I remember participating in a project by the Andre Tosello Foundation that gathered various specialists to present suggestions for the implementation of the directives of the National Biological Diversity Strategy in the areas of Education, Public Awareness and the Exchange of Information<sup>85</sup>. The text reads: “The dissemination of information to fulfil the Convention poses an enormous challenge. Besides the complexity and variety of information in itself (on organisms, ecosystems, including social, cultural and economic issues), we have serious problems of communication and coordination – among agencies, people/institutions with similar or different interests, different regions and sectors (academia, industry, government), to cite just a few examples.”

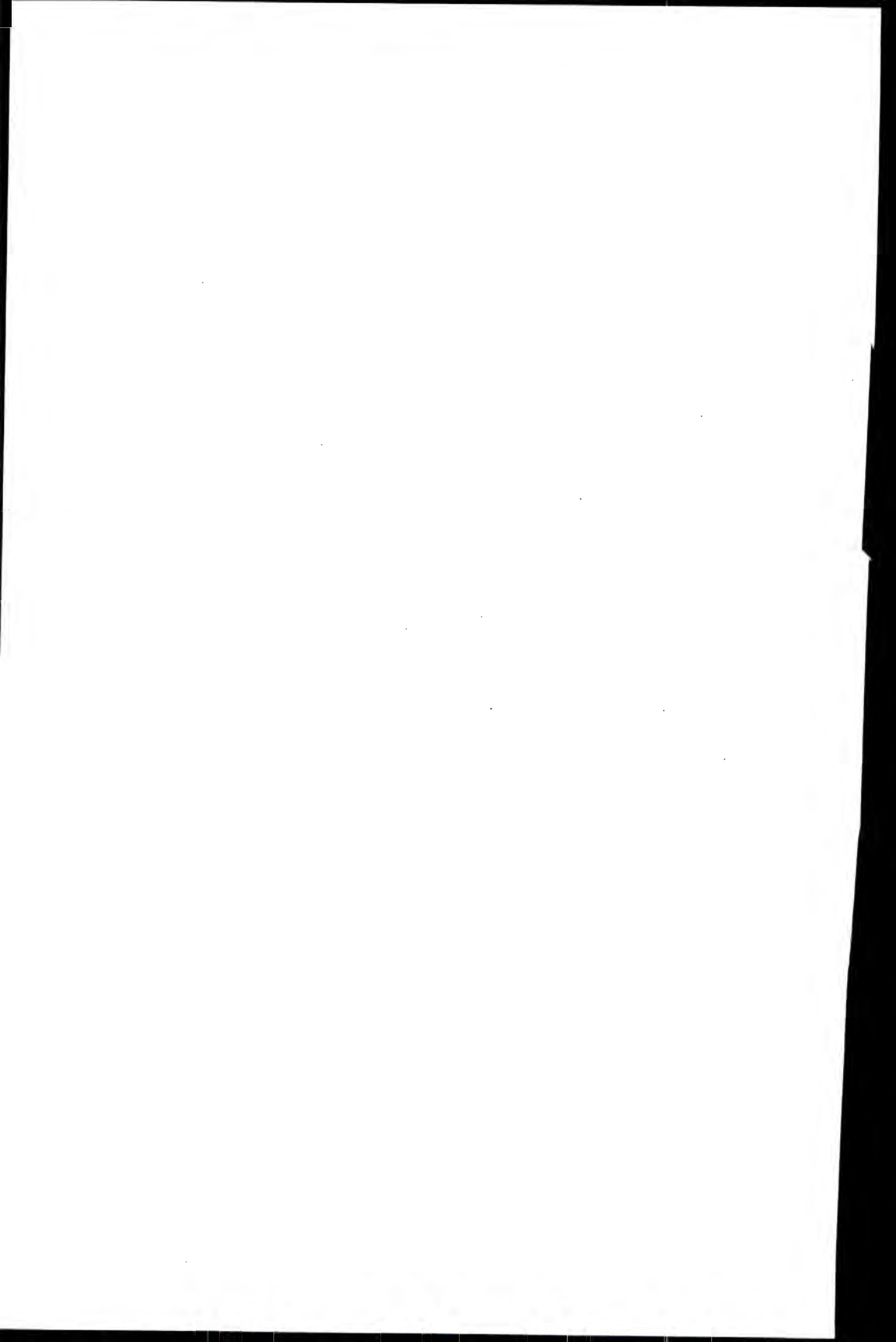
Ten years ago a program exclusively on biodiversity would have seemed a dream. A dream, that is, that was made real through the initiatives of people and institutions that allowed themselves to look upon a reality and opt for a new course. The result generates knowledge and amplifies the debate on what this wealth of Brazilian biodiversity really means. It is just one initiative, but it may inspire various others.

*Maria Zulmira de Souza – involvement with the theme*

My involvement with the theme of biodiversity goes back to the 90s, with the creation of the program *Repórter Eco* and continuing through Rio-92. Prior to becoming involved with Biodiversidade Brasil, I worked as editorial coordinator on the series *Micro Macro*, a co-production between TV Cultura and TVE – Television Trust for the Environment, a London-based producer with ties to the United Nations Environment Program. *Micro Macro* was the first Latin American series on initiatives in Sustainable Development on the continent. Biodiversity was one of the four thematic axes of the program.

On the *Biodiversidade Brasil* project, I am the coordinator of the slot on *Repórter Eco* and former presenter of *Biodiversidade Debate*.

85. Source: <http://www.bdt.fat.org.br/publicacoes/politica/gtt/gttedu//index/> (in Portuguese).



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# Ethical limits for genetically modified organisms

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Alicia Ivanissevich

Modern western societies are in the flow of a philosophical project that began in the 17th Century with the French philosopher René Descartes (1596-1650) and which is based on a conception of man as the master of nature. Genetic engineering has added a new element to this notion: as master of nature, humanity has become the possessor of the intimate mechanisms for the creation of life. Man is now able to pluck out, cut out, add, delete and alter whole chapters of genetic material, modifying not only the individual but also its descendents. He can introduce genetically modified organisms into nature and change – without necessarily being able to control the impact – how they relate to other creatures and to the environment. The moral and ethical responsibility that already existed in relation to the preservation of the environment and human health thus acquires another, fuller dimension.

However, reflection upon the ramifications of this new technology has not kept up with the accelerated pace at which new advances have been made. General awareness of the responsibilities these changes imply has proved all too limited. Even if there is no way we can foresee all of the impact – positive and negative – the use of this new tool could have, it is possible to make prior assessment of the risk that it involves and establish mechanisms to control it. The prescription of ethical boundaries based on consultation with the public would seem indispensable. After all, it is the public that

will, in the final analysis, reap the benefits and suffer the consequences of possible abuses of this new technology. Such issues as the liberation of genetically modified organisms into the environment and the consumption of genetically modified foodstuffs demand the democratic participation of society.

### *Controversy*

Defenders of the production of transgenic organisms (those into which genes or DNA segments from other organisms have been incorporated) allege that the genomes of living beings have always suffered alterations throughout the course of evolution and that genetic enhancement techniques, such as the induction of mutation and hybridisation, are not only ancient, but necessary. However, these processes are slow and limited by natural protection systems and barriers among species. What worries the critics of the new technology is the speed with which these changes have been introduced.

For the defenders of the new procedure, genetic engineering is not only faster, it is also more precise; it allows you to select the desired gene or group of genes while ignoring those of no interest, which nonetheless continue to be passed on to future generations by the natural gene-crossing process. This, they say, makes it safer. However, there are certain differences between the traditional interbreeding of species and the new techniques of genetic manipulation that deserve special mention.

Natural interbreeding among species is always correlative, while the modern techniques allow for the splicing of genes from completely different species. Another point of divergence is the speed – a question of weeks – with which genetic engineering is capable of transferring DNA from one organism to another, as opposed to the much longer timeframe – years and years – required for the natural process. Another point is that the genetic alterations that come of the conventional process occur in only a relatively small number of species, while the purposes envisaged by genetic engineering are rather more ambitious: to produce solutions to control pollution, decontaminate wastewater, use transgenic organisms as factories, among other applications.

## Environmental risk

Scientists who urge caution when it comes to liberating genetically modified organisms into the environment remind us that laboratory and field tests have demonstrated that it can indeed cause environmental damage, and they go on to list some of the main risks: the generation of new and harmful pests and weeds; worsened effect of existing pests; the drastic alteration of ecosystems, with the loss of valuable genetic resources; the production of new toxic substances and loss of biodiversity.

Their concerns focus, above all, on how these new organisms will behave in the environments into which they are released. The chief objection is that genetic engineering allows science to introduce genetic changes into micro-organisms, plants and animals that could never appear by natural means. Once introduced, the genetic material of these modified organisms would, in time, end up crossing with other creatures naturally and with unpredictable effects.

The most sceptical argue that we do not know enough about the field of ecological interaction to be able to predict the consequences of gene transfer. Furthermore, the resultant environmental transformations may not be immediately noticeable and the question of genetic pollution (the dissemination of genes into an ecosystem that would not naturally occur there) is hardly ever taken into account.

For some, the genetic manipulation of viruses is particularly risky. While one contingent of specialists considers it safe to introduce viral proteins into plants in order to make them more resistant to infection, others have grave concerns about the practice. This goes to show how the issue still causes controversy and thus needs further study.

### *Much more debate*

While it is essential to remember that the legal discussions on the use of transgenic products should be guided by scientific studies, we must also not forget that even issues considered technical involve value judgements as well. Situations that pose a threat to human and

environmental safety, for example, must not be analysed from the scientific perspective alone. Whether or not we should run certain risks is a question that transcends the technical domain and demands a more wide-reaching debate that engages all sectors of society.

The apparently simplest way to ensure public participation in decisions on the use of genetic engineering – and one already adopted in various countries – would be to set up a representative committee whose role is to evaluate the matter case by case and provide guidance to the professionals engaged in the field. However, while some view regulation as a priority, others believe it would impoverish progress in research and arrest the expansion of a fledgling industry without necessarily guaranteeing protection to the citizen.

That said, the freedom enjoyed by scientific research and its technological applications ends wherever it starts to put the safety of the population at risk. As Alain Touraine warns in his book “Resistance to New Technology”: “Control over science is not purely scientific and the results of science and technology cannot be accepted or rejected solely upon scientific arguments”, adding that “It seems perfectly natural that social demand be one of the paths by which scientific research seeks direction”.

## The ‘risk’ factor

A risk factor is by no means the ‘privilege’ of genetic engineering. It is present in other areas too, such as pharmacology and chemistry. Yet compared with these two fields, genetic engineering has the advantage of being less of a source of environmental pollution and of harm to public health. On the other hand, a biological accident would have far more devastating effects and be much more difficult to control than similar mishaps in these other fields.

If error in genetic engineering could be catastrophic, transgression is therefore inadmissible. As with any other industry, biotechnology has economic interests to defend that make it all but impossible to expect in-depth ethical questioning from companies whose

chief aspiration is profit. This makes avoiding any form of abuse in this area another reason why it is essential to regulate its activities.

Once released into the environment, genetically modified organisms cannot be recalled and sealed into drums like chemical or radioactive products. The risk of contamination could extend far beyond the locale in which these organisms are originally planted and, unless an effective system is developed to control the circulation of genetically modified merchandise, an entire region could end up being exposed to risk.

### *Grow and preserve*

And so, before putting our new genetic tools widely into use, we have to make a thorough analysis of both the benefits they could bring to the population and to the environment and of the risks society is prepared to take.

As home to the world's greatest biodiversity, Brazil has a duty to remain forever vigilant as to its preservation. By adopting a highly pollutant industrial model, the country embarked on a predatory strategy of occupation and use of natural resources that can be traced back to the colonial period. This unsustainable exploitation of nature has had damaging repercussions not only on an environmental level, but in the social and economic sectors as well. Ecosystems like the Atlantic Forest and Cerrado scrubland, with their enormous productive capacity, suffered such degradation – including the loss of much of their original territories – that little remains to offer future generations.

In this light, the need to follow the directives of the Convention on Biodiversity, ratified at the (Rio-92) United Nations Conference on the Environment and Development in Rio de Janeiro in 1992, becomes glaringly clear. In addition to advocating the conservation and sustainable use of the planet's biological diversity, the convention also underlined the need for the fair and equitable sharing of the benefits arising from the various uses of natural resources. The Convention seeks to legitimise the necessity to make the protection of biological resources compatible with socioeconomic development.



## The role of the media

While for the scientists the great challenge is to acquire as much mastery of genetic technologies as possible in order to minimise risk while maximising the benefits, the goal of society should be to develop a moral code – based on common sense and capable of pondering the economic, environmental, social and ethical implications – by which to guide and regulate the activities of the specialists before the technology is put into general use. The media has a fundamental role to play in keeping the population informed so that the public can question, formulate doubts and reach its own conclusions about the themes approached.

The credibility of the news is essential if we are to increase the quality of information. And we cannot be careful enough in this endeavour. Warning people about the risks transgenic organisms could pose to society seems easy; the hard part is producing a balanced report in which various voices are heard and which does not attempt to corral the reader, listener, viewer or web-surfer into precipitated deductions.

What is important is that we try to consider data, results and arguments alongside fears, suspicions and uncertainties. The good journalist is he or she who is able to use the news report to bring different worlds – like the scientific community and society – a little closer together. We need to be able to tell facts from promises, results from frauds, real stars from mere shiny lights. And, finally, we must always look for balance between exaggerated alarmism and enchantment with the wonders of science.

As such, every new action requires new reflection, with each new technology that arises comes the need for the space and time to observe, consider, examine and formulate questions. The media can be this vehicle that helps us think carefully about the rapid evolution of science and the ethical limits that ought to guide its production.

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# Information as an instrument of defence in the protection of traditional knowledge

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Inês Zanchetta

The site of the Instituto Socioambiental – ISA (Socioenvironmental Institute), on-line since 1997, was created to spread socioenvironmental information – news, campaigns and special reports – on the programs and projects developed by its teams. Biodiversity, socio-diversity, the collective rights of peoples, natural resources and cultural patrimony related to indigenous peoples and traditional communities in Brazil have always been priority.

The wide-reaching and ample divulgation of such information over the Internet is one of ISA's forms of collaboration, as a Brazilian, non-profit civil society organization, towards the national implementation of the Convention on Biological Diversity (CBD), one of the most important accords established during the Rio-92 United Nations Conference on Environment and Development (Unced). Article 17 of the CBD, of which Brazil is a signatory, stipulates that all Contracting Parties shall facilitate the exchange and dissemination of information about the protection of traditional knowledge associated with the use of genetic resources and the fair and equitable sharing of the benefits derived from biodiversity. This encompasses a wealth of information on indigenous and traditional knowledge and the results of scientific and technical research on the issue.

Two examples of the kinds of theme amply divulged through the site and which fit the objectives of Article 17 of the CBD are the debate on traditional forms of knowledge, access to genetic resources and

the distribution of benefits, a theme regularly treated and updated, and the Yikatu Xingu campaign for the recuperation of the Xingu riverheads. On the first of these themes, an extremely complex issue, ISA has produced various news reports over the last five years and one special report entitled *Biodiversidade e Conhecimentos Tradicionais: Mais Proteção Já!* (Biodiversity and Traditional Knowledge: More Protection Now!)

The idea is to encourage debate, provide supplements and try to clarify, for example, the main points of the bill of law on access to genetic resources and the protection of traditional knowledge in Brazil, outlining its pros and cons, what the representatives of the traditional communities say about it and what the researchers and scientists think. Drafted in 2003 with the participation of various sectors and civil society organizations represented by ISA, the bill was sent to the Executive, where it remains stalled. As a reminder, the issue is still regulated under Provisory Measure nº 2 186-16.

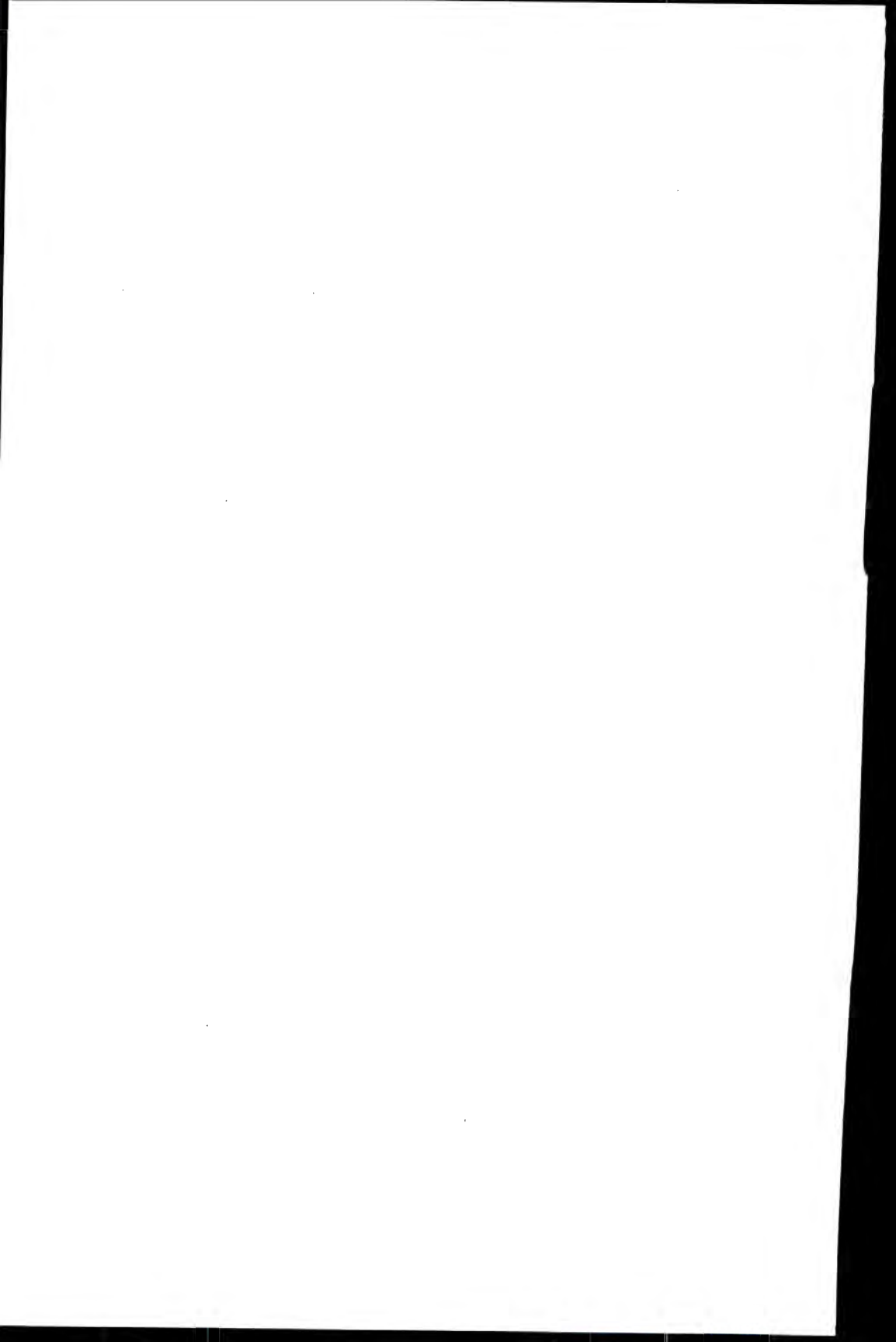
The Yikatu Xingu campaign, which involves the participation of various local, regional and national players, aims to conserve and recuperate the riverheads and riverbank forests of the Xingu River, a symbol of the richness of Brazilian socio-biodiversity. Launched in October 2004 at a meeting in Canarana in Mato Grosso state, the campaign counts on the participation of the region's indigenous peoples, settlers, large producers, researchers, university students, social movements and representatives from the federal, state and municipal governments. It is precisely in this multiplicity of players that resides the singularity and popularity of the campaign, which has managed to bring various and different interests together under the same flag. In order to promote the campaign on the local, regional and national levels, the site is the portal for a specialized channel bringing regular news updates as a means of supporting this large mobilization of forces. These updates are then reproduced in the form of electronic bulletins and sent to approximately 240 partners and roughly a hundred press vehicles throughout Mato Grosso state.

The divuligation of socioenvironmental information, one of ISA's lines of action, goes hand in glove with another, equally impor-

tant initiative: the strengthening of local partnerships with indigenous and other traditional populations, thus contributing to their sustainable development and the dissemination of their knowledge and wisdom. To this end, ISA teams conduct monitoring, gather data and produce documents, analyses, reports and maps, which it makes available to the public via the Internet. Some out-of-print publications are also available for consultation through the site. Throughout its ten-year existence, ISA has produced over a hundred publications and, from its inauguration in 1997 up to September 2005, posted two thousand news items and reports on its website with a view to sensitising the public and the media on such rarely approached themes as the protection of traditional knowledge.

In addition to this, the site also privileges the divulgence of information on correlate subjects, with news and special reports on such themes as the cultural patrimony of indigenous and traditional communities and the huge infrastructure construction projects planned for the Amazon and their related socioenvironmental impacts.

By investing in the site as a tool for the dissemination of information, ISA has fulfilled the mission for which it was created in 1994 – to defend social assets and rights, both collective and diffuse, concerning the environment, cultural heritage, human rights and local peoples, integrating both social and environmental issues. It is in this manner that ISA has made a contribution to the effective implementation of the Convention on Biological Diversity in Brazil.



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# Biodiversity is also a matter of education

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Liana John

E is for elephant, H is for hippopotamus, Z is for Zebra. When learning to read and write, Brazilian schoolchildren still use species from the African savannah as a reference, regardless of the fact that Brazil is one of the three countries with the richest biodiversity in the world, regardless of the fact that these animals do not hold Brazilian passports. When it comes to spelling words out and playing games, on the pages of books – whether didactic, paradidactic, or literary, and for all ages – exotic animals still prevail, eclipsing and devaluing our countless native species. Even the word ‘exotic’, which technically designates what is not native, is frequently used as a ‘chic’ replacement for ‘strange’ or ‘different’. Few people beyond environmentalist circles understand the term in its environmental (and literal) sense.

Although the world’s largest tropical forest is located in Brazil, all too few people, Brazilians included, are aware that it is not actually the home of the Lion King, nor the clever fox, nor the food-stealing bears of the movies, games and books that today present their version of life ‘in the wild’ to an increasingly more urban public. Perhaps some will know that the jaguar is the most powerful feline of the tropics, but they are few and far between who will recognize the agouti as the smartest or the opossum as the laziest glutton.

Ah, could it be that I am referring here exclusively to a middle-to upper-class public that has access to cinema, computer games and



children's books? Unfortunately not. In an interview with members of the landless movement in Pontal do Paranapanema, at their camp near the Morro do Diabo State Park on the western frontier of São Paulo state, I could witness first-hand that the reference to African or Asian fauna is just as strong. Even though some of those landless rural workers were illiterate and despite the fact that they were camped out on the edge of some remaining inland Atlantic Forest – home to anteaters and black lion tamarins – the cultural reference was still that of lions and tigers living thousands of kilometres away. These people do not have access to foreign films, cable TV or beautiful international books, but the reference is on the open channels, product packaging, company logos, street signs, in the shops, in the daily lives of all who circulate in the streets, whether they have purchasing power or not.

The media must certainly shoulder a parcel of the blame for this lack of knowledge, especially given that Brazilian biodiversity has been no more than a generic theme on the pages of newspapers and magazines and in fleeting mentions on TV and radio news since the 90s. It is true that the sites dealing with biodiversity on the Internet range from trivialities to data banks of dazzling density, but in order to arrive at virtual content you first have to know what you are looking for, and, unfortunately, that is why most Brazilian web-surfers steer well clear of the truly rich universe of information the web contains on the country's diversity of species.

More than a mere curiosity, this knowledge gap reflects a dangerous cultural trend. It shows that Brazil has still not appropriated its immense natural patrimony. Worse, it shows that the vast majority of the Brazilian population does not possess the necessary cultural references to recognise this natural patrimony as its own – much less make sustainable use of it.

The necessary cultural appropriation of our natural patrimony and, especially, of our biological diversity will not occur unless Brazilians are exposed to the elements that comprise it, whether through the school literacy process, or in more diverse and sophisticated artistic manifestations like books, exhibitions, theatre, music, TV, cinema



and performances, or even through advertising, so loaded today with foreign references.

Our 1,800 species of bird represent almost 20% of the 10,000 bird species known in the whole world and are the protagonists of unique stories. Nevertheless, many of our children's books tell tales of crows and thrushes, which belong to European avifauna. And when didactic books speak of flightless birds, the example is always the African ostrich, despite the fact that we have rheas right here under our very noses.

Our 500 known species of reptile – and countless others yet to be discovered – put Brazil fifth in terms of diversity in the world. Nonetheless, if we were to hold a survey on the names of serpents amongst our youngsters it is very likely that the cobras of the Far East and the pythons of rock icons and adventure movies would be more widely cited than our own lanceheads, colubrids and tropical rat snakes, even though these can even be found as close to home as the centre of the mega-city São Paulo.

The same could be said for the 530 species of Brazilian mammal that stand out amongst the 6,500 species catalogued worldwide. We are still discovering and rediscovering species of primate, not just in unexplored tracts of Amazon Rainforest, but in Atlantic Forest too. That said, it is still easier to find cartoons, games and toys with gorillas and chimpanzees than muriquis and titis.

In order to change that reality, we must disseminate the traditions of the indigenous tribes, *caboclos* (mixed Amerindian and Caucasian), *caiçaras* (mixed Amerindian and Portuguese), country-folk, slave descendents and riverside communities concerning native species. It is also necessary to disentangle scientific and popular knowledge from the European and American models we have been importing since colonial Brazil. More: we have to insert native biodiversity into the daily life of each Brazilian, from the smallest children of the bushlands to the post-graduates of the large metropolises, not as an empty term, but as a treasure chest to be discovered with all of the senses.

## Sight

In our rush-and-hurry daily routine we learn to prize sight above the other senses. We are visually oriented and, if placed before different species of plant or animal, will almost always be able to spot what is different about them. However, our emphasis on what we see sometimes prevents us from making out small details that could be excellent tips to a better knowledge of each species. It has already been said that the ideal environmentalist should be a little short-sighted, seeing the ecosystem in a bit of a blur, but capable of getting close enough to see details and understand relations that people possessed of normal vision fail to see.

The ideal environmentalist manages to see, for example, the change of eye colour of the great egret, a bird easily found almost anywhere, even in polluted or city-locked rivers and lakes. When the egret's eyes turn blue, it means it's breeding time, so the males grow special, longer feathers, better suited to courting the females. And the courtship is a dance to inspire even the most demanding choreographer.

Looking long and up-close can also unveil secrets invisible on first contact. During a study conducted in the Amazon on the effects of deforestation on animals hanging on in forest remnants, it soon became clear that as the inner forest lost humidity, the wild pigs tended to migrate to larger forest fragments in search of better conditions for their mud baths. Much less perceptible was the disappearance of the frogs, which depended on the pigs' mud baths in order to reproduce. Various researchers noted the absence of the large mammals, but the absence of the small amphibians went unnoticed to all but the sharpest eyes.

That is precisely how it is with a large chunk of our flora and fauna, the vast majority of which does not easily show itself to the untrained eye. While many are content to admire the landscape – and there is no shortage of wonderful landscape here in Brazil – it is essential to know of what those landscapes are made, lest we run the risk of transforming them into empty views. In other words, it is not always enough to just look, sometimes you have to know what it is you are looking at.

## Hearing

An orchestra makes music as opposed to a cacophonous noise when the instruments align in time, when all, from the first violin to the last triangle, obey the rhythm dictated by the conductor and contribute with their own special parts to the construction of the whole. The arduous work of tuning, the meticulous arrangement of the pieces and the conversion of it all into harmony means little, however, if the music does not reach its destination, if it is not heard, or, worse still, if the audience merely hears but does not know how to listen. At orchestral recitals there is always someone who cannot help but endlessly babble. Oblivious to the inconvenience caused to others and, more importantly, oblivious to what is lost in the chatter, such people hear only themselves.

For nature observers, embarking on a forest trail is like sitting in the audience at a concert. Sometimes, with a little luck, you may even get a front row seat. But you have to be silent, you have to hear and know how to listen. Especially in spring, the fauna offers a court symphony. Even when they are not presenting ballets, the mating calls of various animals resound at dawn, at dusk, in the moonlight or in the broad light of day. The birdsong is most evident of all, just like a numerous and finely-tuned suite of violins in an orchestra. In the gallery forests, the savannah of the Central Plateaux, the dense or open forest of the Amazon and the Atlantic coast, or even in the scrubland and in the fields, they sing loud, marking out their territories, locked in vocal duels. Worthy of opera, they improvise without ever going out of tune.

But the birds are not the only stars. Frogs and toads croak from all corners: whether from the banks of large lakes, or from the pools left behind by the last rains, from the 'baths' dug out by the wild pigs, or from the small 'swimming pools' among the leaves of bromelias, which grow in the undergrowth and across the rock faces, from the highest peaks to the wave-pummelled coasts. The amphibians also form their orchestras, with their own sort of harmony, undoubtedly worthy of attention.

The calls of certain mammals also stand out, such as the morning chatter of the howler monkey, the squeal of the marmoset, the powerful roar of the jaguar, the impressive cry of the sloth, used only in very special situations to attract mates. To hear them all, you have to tread softly, know how to wait, to recognise and respect the 'artist' at work. You have to learn how to listen with the soul.

Silence is a good start, but silence is something quite a few weekend 'ecotourists' still need to work on. Recently, in Southern Pará, I learned that a herd of collared peccaries was in some marshland near the bed-and-breakfast I was staying at with a team of fellow journalists. I went there to try to take some photos accompanied by two tourists, both also armed with cameras and excited by the prospect of taking some snaps to bring back home. No sooner had we entered on the trail than I realized it just wasn't going to work. Our companions did not know how to listen and tramped along as if all of the inhabitants of the forest were deaf. The result was no other: before we could catch so much as a glimpse of the peccaries, the herd was long gone. And peccaries are not the most sensitive creatures in the world when it comes to the human presence, often more likely to attack than flee.

More frustrating than having lost out on the desired photos, however, was the realization that it simply did not dawn on those 'ecotourists' the real reason why the pigs had fled. Oblivious to their surroundings, they had missed – and caused us to miss – a good passage in the spectacle of nature.

## Smell

Dulled by an excess of *stimuli* (artificial perfumes and aromas added to the most varied products on the market) or 'anaesthetised' by pollutants (cigarette smoke, exhaust fumes and odours of every order), city dwellers, as a rule, have a damaged, or at least untrained sense of smell. So once in contact with nature, they tend to concentrate on what they see and thus fail to pick up the trail of scent, walking

straight past all but the most obvious of flowers, fruits, animal traces, territorial signals and warnings of all sorts. Subtle, brief, strong, permanent, sweet, aggressive, diurnal, nocturnal, the truth is the smells that translate Brazilian biodiversity are extremely varied and, even so, practically unknown to us.

There are tens of thousands of flowers alone. The privilege of escaping the rigorous cold of harsh winters gifts us with 365 days of flowers per year. We have entire trees that blossom in the middle of the dry season, small flowers that grow upon immense trees, enormous flowers that teeter on the most brittle of sprays. Some exude easy fragrances, others demand proximity and sensibility. Of course we do not have that first week of spring typical of colder climates – when all of the plants bloom at once and fill the air with the most varied perfumes –, but we also escape from hay fever, the allergy of excess. Instead of that concentrated mixture of all aromas and the subsequent pollen-heavy atmosphere, we have the alternateness of diversity: the delicateness of an air that balances a *pitanga* tree in bloom with trunks of *jabuticaba* myrtle covered in white petals. We have diversity, from the omnipresent fragrance of the butterfly lily that lines the banks of rivers and lakes to the fleeting perfumes of hundreds of orchids, each with its own personality.

All this, and we have not yet even begun to mention the fruit: the unique scent of eugenia uvalha in the Atlantic Forest of the Southeast, or of the cashew of the Zona da Mata in the Northeast, or the fragrance of bitter but aptly named passion fruit. And then there's the strong smell of *cupuaçu* in the Amazon, vying with the fermentation of fallen *taperebá* strewn about the forest floor. Not to forget the countless essential oils: *copaifera* balsam, *breu manga* oil, *andiroba*, to name just a few that have found their way into the catalogues of the cosmetics and perfume industry.

And it is not just the flora, it is also important to know the smell of our fauna. 'Leopard breath', that old, but half-forgotten insult, has its base in reality. But its not just the bad breath, the hormones excreted by felines, bush dogs and monkeys smell just as strong and can serve as tracks every bit as clear as paw-prints in the sand when

it comes to orienting man as to the presence of this fauna in the ecosystem. They were tracks used by hunters (and still are, unfortunately, even though hunting these animals is now illegal in the country), and could be revitalized for use by observers of fauna, photographers or simple tourists.

Brazilian biodiversity still exudes a profusion of smells, ready to be rediscovered and valued. From the soil up – from the dense wood-cluttered forests to the reeking swamps – our ecosystems have their own odours, which give them identities that Brazilians ought to be able to recognise. The smells of Brazil set our ecosystems apart from those of other regions of the planet and we have to re-learn to recognise them.

## Taste

Hand-in-glove with the smells, the tastes of Brazilian biodiversity also need attention and rescue. Present in the supermarkets, restaurants, kitchens and on tables, incorporated into regional cooking and, in some rare cases, to be found in the recipe books of famous chefs, the tastes of Brazil are generally more readily available to the population. Yet they still need to acquire status as representations of biological diversity, not merely as ingredients on a vast list of possibilities constantly extended through agricultural technology and the ease of importation in the globalised world.

We have to educate our children's palates, teach them the differential that exists in eating hand-picked fruit, so that they know how to distinguish what comes from their own land from what comes in from outside. That is not to say that all sorts of foods cannot be mixed – not only can they, but they should –, yet it is important that we have their origins, history and difference in taste on the tips of our tongues. At least that way it does not all boil down to the same old stew.

From the souari nut of the Cerrado scrubland to the peppers from all over; from the tasty physic nut of Araucaria Forest to the eternal cassava, whether boiled, fried or ground into flour, the tastes



of Brazil also comprise a rich universe ready to be explored. While in recent years they have won some space in the media, mainly on TV cookery shows and in the pages of women's magazines, these tastes still need to find their place in the school lunch, in the History and Geography of Brazil and in every home in the country.

## Touch

For many years, museums were understood as organized archives of history: Natural History, Human History, History of the Earth, History of Art... Exhibitions were mounted to be seen at a distance, from behind the security cordon, following the example of the schools, where knowledge was a one-way flow from teacher to student, occasionally from one student to another and never from the students to the teacher. Then came the experimental, hands-on museums, and it became clear just how much richer it was for the mind when you could lay your hands on the subjects of study. More than that, we discovered that learning is a two-way flux and that a horizontal relationship beats any knowledge pyramid hands down when it comes to efficiency.

This lesson cannot be ignored in our pursuit of the population's appropriation of Brazilian biodiversity. Understanding the richness of living side-by-side with so many species of animal and plant also demands a hands-on approach. It's not enough to see, hear, smell and taste, we also need to touch. After all, as a popular children's song goes, right in the middle of the palm of the hand "there's a line that goes straight to the heart".

When we take recourse to the sense of touch, we lay aside the two-dimensionality of watching and enter the three-dimensionality of immersion. Of course, we cannot touch everything, many species, suffering under the pressure of our negligence and selfishness, need to be protected from us. But to recognise the habitats of so many species by the touch, to learn in the skin what burns, what soothes, what pricks, what dissolves or sticks, is to insert man into the environment – the *sine qua non* for a mobilizing knowledge.



Is it risky to propose direct contact between people and nature? Absolutely. It requires a level of organization and careful control that we are far from possessing, but what we need to assess is whether it might not be even riskier to leave so many people out of touch with our ecosystems. With neither love nor admiration for the parts that comprise it, how could we know how to recognize the value of our biodiversity or invent alternative livelihoods or forms of production that make responsible use of it? What we most sorely need is a sustainable relationship with our natural resources and the vast array of options our immense biodiversity provides.

And so, the only possible invitation is this: hands to work! Not just hands, though: hands, eyes, ears, noses and tongues... there's a lot of work ahead for us all.

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# The future, in whose hands?

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Nurit Bensusan, Ana Cristina Barros, Beatriz Bulhões and Henyo Trindade Barretto Filho

*We devastated more than half of our country thinking  
that we had to leave nature to go down in history:  
but the latter, given its predilection for irony,  
now demands of us that very nature as our passport.  
Eduardo Viveiros de Castro*

The Convention on Biological Diversity, like any other international treaty, is not the solution to any of the issues we come face to face with each day in Brazil – nor was it intended to be, though it does indeed help indirectly. For example, it is because of the CBD that biodiversity and the preservation of its integrity now rank among the concerns of Brazilian society. In addition to this, the CBD also fosters the exchange of information, helping to find solutions and secure support for projects through the mediation of the GEF<sup>86</sup>. The constellation of experiences described in this book shows that the Convention created a framework for the activities of various institutions within Brazilian society, which have, as has been shown herein, played a significant role in its implementation.

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86. Global Environment Facility, the financial mechanism of the Convention on Biological Diversity. For more information on the GEF, see the introduction to this volume.

A lot undoubtedly remains to be done and there are many ways in which to do it; one being by “brute force”, meaning more action, more funding, more projects and, consequently, more results. Another way – of which some examples have been given in this book – is through strategic synergy between the various sectors of society. This synergy would serve to potentize the actions undertaken while reducing the amount of energy wasted on avoidable conflicts. However, this synergy, fostered through inter-sectorial dialogue, has to fall within the ethical limits considered acceptable by all sectors involved.

Recently, as some of the chapters in this book attest, an effort has been made to include the private sector in the debates on the Convention on Biological Diversity, mainly on behalf of the Convention itself. This sector, identified as fundamental to the progress of the implementation of the CBD, has still not been engaged in an effective manner. In Brazil, a cycle of inter-sectorial dialogue has to be set in motion in order to broaden the knowledge of the various segments as to the needs and expectations of others in relation to the conservation of biodiversity, its sustainable use and the sharing of the resulting benefits.

Within the scope of the CBD there are many issues that could spark this debate. One such issue is compensation, that is, possible ways to compensate for any losses of biodiversity that arise through private enterprise. Discussions on this theme have to be conducted as openly as possible, considering the needs of all involved whilst taking due care to avoid compensation being seen as mere payment for the right to destroy. For those who hold this view, whoever has the money can get any project off the paper, as the compensation is only monetary and any discussion on the theme will not extend beyond financial sums. However, at the crux of compensation lies the concept of non-monetary forms of compensation as well, ranging from simple modifications to the original project proposed to the realisation that a project cannot go ahead. This perspective gives the Convention back its original role as a source of alternatives to counterbalance the classic instruments of the market.

Another theme that could set this inter-sectorial dialogue in motion

is the sharing of the benefits arising from the use of genetic resources or associated traditional knowledge. This theme brings together the interests of various sectors, such as companies, NGOs, indigenous peoples and local communities, academic researchers and public education and research institutions. This kind of dialogue could help in the bid to build a system for access to genetic resources and the sharing of benefits that is fair to all concerned.

In addition, the private sector's engagement in the implementation of the CBD could be secured through formal mechanisms within the CBD itself, stimulating, for example, the participation of experts from the private sector in the SBSTTA meetings, among other working groups. Another way to amplify the business sector's participation in implementing the objectives of the CBD and of making that participation effective is to recognise and disseminate the voluntary initiatives taken by companies, business associations and the government, such as certifications, compensations, codes of conduct, best practice guides, eco-efficiency actions in production processes, partnerships with the relevant agents, the creation of incentives for biodiversity best practices, and the revision of the criteria applied in the concession of loans and investments.

## The consequences of a diversity of perceptions

One of the stiffest challenges for those who worry about maintaining the integrity of biodiversity is to spread that concern, leading other sectors of society to start taking the environmental variable into consideration during planning. This is neither a small nor a simple challenge given the multitude of interests and the variety of viewpoints nourished by core focuses that often run counter to the preservation of the integrity of biodiversity.

One of these perspectives is that we, humanity, could get along perfectly well without nature and its diversity, a viewpoint contra-

87. G. Daily elaborated on this example, originally conceived of by John Holdren, in the introduction to a book she edited in 1997, entitled: *Nature's Services – Societal Dependence on Natural Ecosystems*. Island Press, Washington DC, p. 1-11.

dicted by an example offered by Gretchen Daily<sup>87</sup>: imagine you are leaving for the Moon, where you plan to live a normal and satisfactory life. In the interests of simplicity, let us imagine the Moon has an atmosphere and climate similar to those on Earth. You have packed your bags and now must decide which, of the thousands of species on the planet, you plan to take with you. As a pragmatic individual, you start off by choosing species that can be used directly to provide food, fibres, wood, medicines and other products like oils, rubber and resins. The list could easily reach into the hundreds or even thousands of species. However, when you think a little better of it you realise that you will also have to bring the species that guarantee the survival of those you have put on your list. So which species are those? There is no answer to this question. Nobody knows which or how many species are actually needed to sustain human life.

So you could take another approach and try to list the environmental services you will need on the Moon, such as the purification of water and air; decomposition of waste; generation and maintenance of soil quality; the pollination of food species and natural vegetation; the control of plagues, blights and illnesses; seed dispersal; the moderation of extreme temperatures and wind speeds; and protection against harmful ultraviolet rays. How many species would you have to bring to ensure all these services? How many species, for example, would be needed just to guarantee the fertility of the soil? A simple gram of soil contains some 30 thousand protozoa, 50 thousand algae, 400 thousand fungi and billions of bacteria. If we move up a scale, there are also thousands of insects and worms. So what species should you bring? At this stage you will probably have given up on going to the Moon...

Another perspective that fosters the idea that we could live without nature is the notion that we could substitute it all with technology. This substitution, besides being improbable in virtue of the complexity of the natural processes and their consequences for humanity, would also be – were it actually possible – exceptionally expensive. In 1997 a group of researchers estimated the annual cost

of replacing the services provided by the ecosystems – imagining that it could be done – at 33 trillion dollars. The study<sup>88</sup> was carried out in 16 different environments and contemplated 15 environmental services at each, including the regulation of the chemical composition of the atmosphere; climate regulation; the control of soil erosion; the production of foodstuffs; the regulation of water flows; water supply and storage; and pollination. For an idea of the order and magnitude of the cost of these services, one needs only to consider that the world's combined Gross Domestic Product is somewhere in the region of 18 trillion dollars per year. The forests and humid areas, such as wetlands like the Pantanal in Mato Grosso, would account for 9.3 trillion dollars (28.1% of the estimated cost of 33 trillion dollars), while the coastal systems would require 10.6 trillion (32.1% of the total).

In Brazil, a specific study was conducted at the Jataí<sup>89</sup> Ecological Station, a 4,500-hectare protected area in São Paulo State, with a view to calculating the cost of the services provided by the ecosystems protected there. An analysis of 16 environmental services concluded that their combined value was in the region of 730 dollars per hectare per year. In other words, the total annual value of the services provided by the Station was 3.3 million dollars.

The substitution of these environmental services with technological alternatives, imagining it were possible, would also significantly increase social exclusion. For those who already struggle to pay their water rates, for example, the need to substitute the natural mechanisms that maintain water quality with technological treatments would make that service considerably more expensive and could even mean the difference between having and not having access to water.

Another misconception about maintaining the integrity of biodiversity is that a set of protected areas would be enough to protect it. This “we’re-already-conserving-nature-in-protected-areas-

88. R. Constanza et al. 1997. The value of the world's ecosystem services and natural capital. *Nature*, volume 387, nº 6230, p.253-260.

89. J.E.Santos et al. 1997. *Funções ambientais e valores dos ecossistemas naturais. Estudo de caso: Estação Ecológica de Jataí*. In: Anais do Congresso Brasileiro de Unidades de Conservação, vol. 2. p.465- 477.

so-now-we-can-destroy-the-rest-of-the-planet” syndrome has tragic consequences for biodiversity. Even inside protected areas, the conservation of biodiversity depends on the maintenance of the ecological and evolutionary processes that occur on temporal and spatial scales that transcend the protected areas themselves.

The alarming belief held by some that the Earth has already gone through various episodes of mass extinction and that the impact wrought by man is therefore no different is another idea that compromises biodiversity. Table 1 below summarises all known major extinctions. However, it is interesting to note how long it took for the diversity to recover: a matter of millions of years – a brief timespan on the geological scale, but considerable in human terms. So, while it is certainly true that mass extinctions do occur and have been part of the life of this planet, the most famous being the disappearance of the dinosaurs, whether humanity would be able to wait millions of years for the Earth to recover and for the basic processes that produce the conditions for life to return is another matter entirely.

**Table 1 – Episodes of mass extinction<sup>90</sup>**

Episode of mass extinction	Observed extinction of families (%)	Calculated extinction of species (%)
End of the Ordovician (439 Mybp)	26	84
Upper Devonian (367 Mybp)	22	79
End of the Permian (254 Mybp)	51	95
End of the Triassic (208 Mybp)	22	79
End of the Cretaceous (65 Mybp)	16	70

Mybp: million years before present

90. Adapted from D. Jablonski. 1994. Extinctions in the fossil record. *Philosophical Transactions of the Royal Society of London Series B* 344 (1307): 11-17.



These and other perceptions create difficulties in expanding the agenda of biodiversity conservation and the rational use of natural resources. Unfortunately, we cannot abandon ship, nor call the bluff. We have to keep on demonstrating the importance of biodiversity lest humanity's time on this planet become nothing more than a 'momentary lapse of reason'<sup>91</sup> from which the planet will recover, and easily, over the next few million years.

## An expanding constellation?

Both within and beyond the Convention on Biological Diversity, experiences like those described in this book must increase in number and in scale. The private sector's growing concern with the environment, the increasingly greater importance the theme is given in the economic sections of newspapers and the efforts of non-governmental organizations and social movements seem to be showing that the environmental issue is beginning to rank amongst those considered important for humanity. We can therefore expect the constellation of experiences related here to grow.

However, this tendency is worthy of a little reflection. The axis on which these "central" issues are plotted was created and is maintained by a small set of countries and a small minority inside those countries. Matters of importance to the populations of India, China, Latin America and Africa do not feature on this axis. Otherwise put, these issues are not really "central" to humanity, but merely to those who hold the power – to those who run the mechanisms of the market and are most thoroughly involved with them. Along with the knot of worry about biodiversity comes the seed of transformation: the possibility of dealing with diversity in all of its dimensions.

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91. A reference to the title of an album by the British band Pink Floyd. The presence of our species upon the earth could be considered a momentary lapse, especially in terms of its brief span of geological time. We have only been here for a very short while when compared with the age of the earth, the solar system and the galaxy, etc.

The greatest challenge of all is not to miss this opportunity and to make the seed germinate. This means that concerns about biodiversity cannot be restricted to the designs of the so-called market and to economic incentives, but should also equally embrace social participation, transparency, a diversity of solutions, etc. Moreover, what we should really be aiming for is a shift in this axis of "central" issues towards a concern for socio-biodiversity as opposed to biodiversity being dragged into an increasingly more monetarist line with less diversity in terms of thought and options.

The Convention's return to its origins, that is, to the search for alternative solutions, both in terms of the use and conservation of biodiversity and of access to genetic resources and associated traditional knowledge and the subsequent sharing of the benefits, is fundamental if the constellation of experiences described in this book is to extend its reach and multiply. Having a diversity of solutions on offer is undoubtedly the most fertile ground for a growing interest in biodiversity and the fostering of the inter-sectorial dialogue so essential to the implementation of the CBD.

## What exactly was so new in the CBD?

After 14 years of the CBD and given its low degree of implementation, we run the risk of losing sight of the innovations the Convention brought. It is important to rescue this, especially now, when the implementation of the Convention and its instruments is under discussion. Below are some of the CBD's main innovations:

### *The consolidation of an ample definition of biodiversity*

The CBD defines biodiversity as "the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems".

This ample definition, which encompasses all kinds of variation in forms of life and the existing complexes on Earth, was decisive in, among other things, consolidating the importance of maintaining diversity in small populations, valorising differences between landscapes and generating a perception of the interconnection between these various levels of biological diversity. Its repercussions have been and still can be felt in the public policies and legislation of various countries, including Brazil.

*The role of local communities and the indigenous peoples in the conservation and rational use of biodiversity:*

Article 8j of the CDB says that the Contracting Parties shall “respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices”.

This article recognises that the knowledge and practices of these communities perform an important function in the conservation and sustainable use of biodiversity, opening up a broad front of debate not only on the protection and use of traditional knowledge, but also on the role of these communities in protected areas and in other instruments for the conservation and use of biodiversity. The latter corroborated the already old discussion on human presence inside protected areas, while the recent advances, though still somewhat limited, are due, at least in part, to the CBD's recognition of the role these communities play.

One of the advances most worth citing is the fact that the Brazilian authorities have finally recognised the presence of these local communities inside the strict use conservation units – in other words, in those where no human residence is permitted – as expressed in the items dealing with the theme in the Law for the National System of

Protected Areas<sup>92</sup>. This recognition is somewhat ampler when it comes to sustainable use conservation units, where there is an attempt to develop a territorial management model that permits the conservation and sustainable use of the natural resources, as in extractivist and sustainable use reserves.

Recognition of the role of the indigenous peoples in conservation has also grown. In Brazil, in addition to the projects devoted to protecting biodiversity on indigenous lands, the idea that these peoples have conserved and continue to conserve considerable portions of Brazilian biodiversity has also attained mounting acceptance.

In relation to the specific matter of traditional knowledge, this article led to legal and institutional instruments being adopted in various countries, including Brazil, to protect this knowledge and regulate its use. Evidently, these mechanisms are still not as efficient as we would wish, but the fact that the issue is on the agenda is an indication of progress in itself and, with the recovery of the original conceptions of the CBD, offers a glimpse of further advances still to come.

*The fair and equitable sharing of the benefits arising from the use of genetic resources*

This notion, created by the Convention, was originally very interesting, despite being extremely difficult to implement. As already mentioned elsewhere in this book, benefit sharing is currently thought of as either extremely difficult, if not impossible, to implement, or as bait, as a disguised form of commercialisation with many pitfalls for the provider of the genetic resource or associated knowledge. And this has largely been true for the indigenous peoples and local communities. Quechua<sup>93</sup>, an activist, has described benefit sharing as it generally occurs in the following terms: “Contractual

92. Law nº 9985/2000.

93. Alejandro Argumedo, cited in *The Traps of “benefit sharing”*, an article by Silvia Ribeiro in the book *The Catch: Perspectives in benefit sharing*, edited by Betty Burrows and published by The Edmonds Institute in 2005.

benefit sharing is like waking up in the middle of the night to find your house is being burgled. On the way to the door the burglars turn and tell you not to worry, that they'll give you a share of whatever profit they get on the sale of what was originally yours".

Among nations, however, the mechanism of benefit sharing recognises megadiversity and the difference between those that possess the resources and those that possess the techniques. Even though the implementation of these mechanisms is still incipient and restricted, based upon few effectively creative alternatives, it does provide a ready-made space in which to test new solutions and possibilities.

The major challenge for benefit sharing, both when the providers are indigenous or local communities and when the agreements are between countries, is not to lose sight of the fact that, in its original conception, benefit sharing envisaged the common good and was practiced for thousands of years by various human groups. Only when seen from this angle, and with the support of the Convention, will benefit sharing find its way.

## The future is in our hands

Implementing the Convention on Biological Diversity is a daunting challenge, as has been exhaustively shown throughout this book. This challenge is so significant for a variety of reasons:

- Biodiversity, its conservation and its use depend on complex biological processes that are still not fully known or understood;
- The instruments for conservation, sustainable use and benefit sharing depend on various sectors of society, many of which are still not convinced of the importance of biodiversity;
- The implementation could be done in many ways and it is essential that the CBD, in its interpretation, allow these various alternatives to co-exist, as there is considerable diversity in the realities both among nations and within nations;

- The effective implementation of the Convention presupposes the intense participation of all sectors of society and constant dialogue between them;
- The implementation of the Convention and the prospects for economic development conciliated with nature, common rights and those of the minorities depend as much on commitment as on concrete action on the part of national and international players.

The major challenge is, therefore, to keep on believing, despite all the difficulties, that it is possible to change the world and to create the instruments to achieve that. This book shows that there are many who still believe and who are doing their part, making it clear that the future belongs to those who build alternatives in the present.

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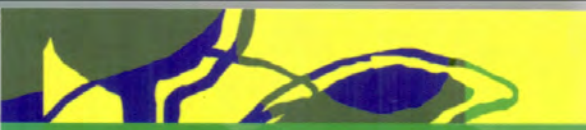
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• this 6<sup>th</sup> episode of mass extinction of biodiversity will become a reality.

Promoting the mainstreaming of biodiversity within the different segments of society as a means towards achieving its effective conservation, sustainable use and the fair and equitable sharing of the benefits arising from that use is the main goal of the Convention on Biological Diversity. This inspiring book looks at a cross-section of Brazilian non-governmental organizations and companies and shows how they are assuming their part of the responsibility in the complex and challenging implementation of the Convention on Biological Diversity in Brazil. They provide examples that must be multiplied both inside the country and abroad.

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Secretariat for Biodiversity and Forests  
Ministry of the Environment



Support:



Companhia  
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Realization:

