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R E P O R T

Progress In the Development of the Program of Work on Protected Areas

Region: Amazon Biome

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- Royal Government of the Netherlands
- Organizations and representatives of indigenous and local communities of the Amazonian countries.
- Organizations, representatives and individuals participating in workshops and other meetings related to the construction of Vision.

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Presentation

At the seventh session (2004) of the Conference of the Parties to the Convention on Biological Diversity (CBD), the Program of Work on Protected Areas (PWPA) was signed through Decision VII.28, which aims to support the creation and maintenance of complete national and regional systems, effectively managed and ecologically representative of protected areas that contribute to achieving the CBD objectives and to reduce the current rate of biodiversity loss.

At the eighth session (2006), the Conference of the parties reviewed the implementation of the PWPA and the VIII/24 decision was adopted. In this decision, the need is recognized to systematically collect relevant information in order to facilitate assessment of the PWPA progress towards the 2010 target for biodiversity and other global goals. In this regard, the parties are encouraged to move forward in preparing their national reports focusing on results and in the implementation process to facilitate a strategic assessment of progress, difficulties, obstacles and capacity - building needs. At COP 9 it was agreed that the fourth national reports should report on national progress as to the 2010 and 2012 targets of the PWPA, so that at the tenth meeting - COP 10 - to be held in October 2010, the implementation of the Program Work on Protected Areas would be reviewed in depth.

The decisions adopted within the framework of the PWPA, represent major opportunities to implement the program of work at the subregional level since they recommend further development of cooperation processes for the establishment of cross boarder protected areas and ecological networks in terrestrial and marine environments.

Similarly, the II Latin American Congress of National Parks and Protected Areas (Bariloche, 2007) calls for the establishment of ecological networks and systems of protected areas at all levels, with particular emphasis on a regional approach, including the case of the Amazon as a way to build complementary to national systems, in order to achieve representation in conservation efforts. Also, recognizes all the work of initiatives such as the ACTO (Amazon Cooperation Treaty Organization) in the Biodiversity Action Plan. This approach builds complementary across the national systems of protected areas and assures greater representation of all ecosystem types, the maintenance of ecological services, and greater resilience of the Amazon Biome to the threats of climate change.

In addition, the Latin-American Network for Technical Cooperation in National Parks, other Protected Areas, Wild Flora and Fauna (REDPARQUES)[1], at a meeting held in Mexico (2008), identified the development of opportunities for dialogue at the subregional level as a priority within the work plan of the network in order to assess progress in implementing the PWPA and in order to initiate sub-regional exercises of conservation gap analysis for terrestrial, freshwater and marine environments, taking into account, inter alia, criteria of representativeness. **The Amazon Biome** was considered one of the priority sub - regions.

In light of all of the above, REDPARQUES has led, in partnership with the World Wildlife Fund (WWF), the International Union for Conservation of Nature (IUCN) and the Secretariat of the Convention on Biological Diversity (CBD)[2], the Construction of the **"Ecosystem Based Vision of Biodiversity Conservation for the Amazonian Biome"**. This work began in August 2008 (Bogota-Colombia), where directors and technicians of the protected areas systems of the Amazon countries, put forth some elements of the vision and agreed a program of work to assess progress in implementing elements of PWPA at the regional level, through the realization of the following workshops: a) Regional Opportunities of Conservation in the Amazon Biome, b) integration of the vision of indigenous and local communities in this initiative of conservation of the Biodiversity for the Amazon Biome, c) analysis on the effectiveness of protected area management; and d) review of financing strategies for protected areas.

The agenda agreed on was presented and supported by the Directors of the Protected Areas System of the Amazon countries in the subregional workshop organized by the CBD Secretariat in Salinas Ecuador (23 - 25 September 2008), orga-

1. Technical alliance of public institutions in charge of the administration and management of protected areas and private institutions related to protected areas in 19 countries in Latin America, whose main objective is to contribute to the conservation of biological diversity of the region and developing national systems of protected areas through the exchange of experiences and mutual reinforcement, currently represented by Dr. Julia Miranda, Director of National Parks of Colombia as REDPARQUES Regional Coordinator.
2. And with the participation of the Amazon Cooperation Treaty Organization (ACTO) and the Andean Comunity of Nations (CAN).

nized to discuss progress in implementing the PWPA. The protected area systems of the Amazon Biome at the meeting, pledged to continue supporting this initiative and its agenda of work, bi - national and regional progress as well as to develop new efforts under the leadership and support of REDPARQUES, and the technical support of international NGOs and other stakeholders.

Subsequently, within the framework of the World Conservation Congress in Barcelona (October 2008), REDPARQUES led a motion (134) for the **"Construction of an Ecosystem Based Vision of Biodiversity Conservation for the Amazonian Biome"**. The aforementioned initiative was adopted in plenary by the IUCN (Resolution 073). Support by IUCN and its members is achieved by means of the motion in order to develop the program of work proposed by the systems of protected areas in the Amazonian states and the importance of consolidating progress in this Amazon initiative is established through a **regional report**, complementary to national reports, in order to be socialized at the next Conference of Parties of the CBD -COP 10-.

In a meeting with some of the Directors of the System of Protected Areas in the Amazon (Bogota, May 2009)[3] whose objective was to review the development of the agenda and schedule activities, it was proposed to continue work in the aforementioned document by means of the formation of an editorial committee, integrated by one representative of the Protected Areas Systems of each Amazonian country.

This group was empowered to monitor and to advise on operational and technical process of preparing the report and to socialize with the Directors of the Protected Areas System and other relevant players in their country on the commitments and progress in this work. The editorial committee's work was supported by a coordinating head; a consultant who collected documents and information, structured text and who sent for reviews, accessories and more. All this based on guidelines laid out previously by the directors of the protected areas systems of the Biome and the coordination of the ecological vision of conservation.

The technical basis of the regional document is formed by the reports submitted by the Amazonian countries to the CBD, as well as technical papers, regional plans and programs related to the goals of the Program of Work on Protected Areas in the region, built by different players and the memoires of the workshops scheduled in the framework of the construction of the Ecosystem Based Vision of Biodiversity Conservation for the Amazon Biome[4].

3. Participants: Julia Miranda: REDPARQUES Coordinator, Lisa Janishevski: Programme Assistant CBD Aymoré Anael Jacob ARPA Brazil program director, Luis Alfaro, head of the national protected areas by the State, Peru, Leonardo Millán Saavedra, National Parks President, Venezuela; Edgar Villareal: INPARQUES General Director, Carlos Salinas, Director of ACTO programs, Victor Hugo Inchausty: IUCN Advisor for South America, Jorge Rivas, coordinator of protected areas - Natura Foundation, Jose Yunis: TNC Director Alvaro Espinel: RANPA Consultant, Manlio Roca: WWF Bolivia Amazonia Programme Coordinator, Claudia Maretti: Conservation Director WWF Brazil, Ximena Barrera, director of public policy and corporate responsibility WWF Aiesha Williams: Responsible for protected areas in Guiana, Emilio Rodríguez, deputy technical director, national parks of Colombia, Rodrigo Botero , Maria Fernanda Cuartas, Paula Bueno: national natural parks of Colombia.
4. Workshops:
   i. Regional opportunities for the conservation of the Amazon Biome (3 events)
   ii. Management effectiveness of protected areas (an event)
   iii. Financing (an event)
   iv. Organizations and indigenous and local communities (an event)

The events developed to advance in building the vision, constituted itself in an opportunity for each country to gather, consolidate and complement relevant pertinent information, but also spaces were opened wherein the scope of the process was agreed on, as well as its methodological approach, the structure of the report, and assessment and feedback on the progress made. In this regard, working groups were created to discuss the different subjects (conservation gaps, effectiveness in the protected areas management, financial sustainability, among others), conformed by professionals from the protected areas systems of the Amazon countries. In addition to the scheduled workshops, a meeting of the editorial team was held, which represented an opportunity to revise and complement the document and define other technical and operational aspects so as to guarantee the consolidation of the regional report in a timely manner and with the levels of quality expected.

In the following paragraphs the results of the development of the agenda in building the Ecosystem Based Vision of Biodiversity Conservation for the Amazon Biome are consolidated in the following chapters, as well as the conservation and implementation of the PWPA at the regional level. This document consists of four sections; the first section, delivered in the way of an executive summary, briefly describes the importance of the biome and the main advances in the development of the Program of Work on Protected Areas. Subsequently, a "Context" chapter is presented which outlines some geographical features of the Amazon, the importance of the territorial space in terms of biological, hydrological and socio-cultural processes and the players that transforms their ecosystems.

The following section describes and assesses the progress in developing the agenda in building the ecological vision of conservation of the Biodiversity the Amazon Biome and therefore the elements of the Program of Work on Protected Areas (decision VII/20): actions for planning, selecting, establishing, building and managing systems of protected areas and sites, governance, participation, equity and benefit sharing, conservation-friendly activities (area management, financial sustainability, communication, education) and rules, assessment and monitoring.

The fourth and final chapter summarizes the main regional progress in meeting the objectives and goals of the PWPA and establishes a set of strategic actions and activities in the short term (1-4 years), medium term (5-7 years) and long term (8-10 years) which the Protected Area Systems of Amazonian States plan to develop collectively so as to strengthen the process of vision and hence the effective implementation of the Program of Work on Protected Areas at the regional level.

This action plan proposal is the product of the results of regional workshops held in connection with building the vision, complemented by a team of systems of protected areas in the countries which form the editorial board and which supported the structure of this regional report. Similarly, the Directors of the System

of Protected Areas in the Amazon, in a workshop held in Peru (August 22 to 25, 2010) studied the action plan and perfected it, including specific strategic actions, activities and deadlines.

This document constitutes a motivation. The foundations for progress have been laid on what would be a shared vision of conservation of the biodiversity of the Amazons. We know that the future of this strategic territory depends on maintaining the integrity of ecosystems, ecological processes and regional climate dynamics in order to withstand the threats and pressures of climate change and the transformation due to the current demand for natural resources and current economic development.

We face an immense challenge. We look forward to continuing to catalyze political will and institutional and social commitment, so that the progress made so far is strengthened and thus we manage to safeguard this strategic territory, which concentrates high cultural diversity and land and freshwater biodiversity, a unique water potential, and the largest rainforest in the world. This wealth of resources has provided life conditions for many communities both inside and outside the region. In consequence all efforts undertaken for the conservation of this territory are a responsibility not only of the environmental community, but society in general.

Julia Miranda Londoño
REDPARQUES Regional Coordinator

Executive Summary

ON THE IMPORTANCE OF THE AMAZON BIOME

The Amazon region is located in the South America. It is shared by nine countries: Brazil, Peru, Colombia, Bolivia, Venezuela, Ecuador, Guiana, French Guiana and Suriname. Their size varies according to the criteria[5] and interpretation used, between 5,147,970 km^2 and 8,187,965 km^2.

It is considered one of the largest wildlife areas in the world. Six of the countries sharing the Amazon are considered mega – diverse countries. The Amazon Biome concentrates high terrestrial and freshwater biodiversity:

40,5% of the species of mammals known in the basin are endemic.

© Michael Gunther / WWF Canon

75% of the vascular plants known in the basin are endemic.

© Parque Nacional Natural Puracé, Archivo Parques Nacionales Naturales de Colombia, Carlos Porras

5. Ecological (6.850.781,49 km^2), Hydrographic (6.118.334 km^2), political – administrative (7.413.827 km^2), etc.

57% of the species of reptiles known in the basin are endemic.

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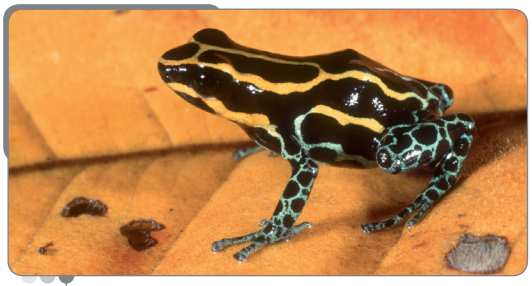
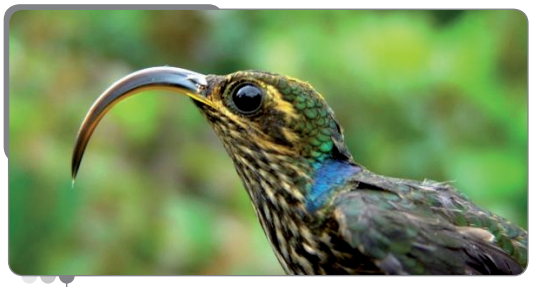


90% of the species of amphibians known in the basin are endemic.

© Martin Harvey / WWF-Canon



20% of the species of birds known in the basin are endemic.

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This Biome has the most diverse freshwater ichtyofauna in the world. Over 3000 species of fishes have been described, but this value is estimated to increase up to 9000 species.

© Fernando Trujillo / Fundación Omacha

The Amazon Biome represents 53% of the tropical rainforests of the world. The diversity of the Amazon forest ranges from 150 to 312 species of trees per hectare. The photosynthetic reserve is the largest and best selection gene bank in the world. There is the greatest amount of living matter per unit area of the world. Whereas there are, in temperate forests, from 60 and 140 tons of living material per hectare, there are records of between 160 and 510 tons per hectare of living matter in the Amazonia.

The Amazon biome also plays a fundamental role in the ***climate system***. The Amazon Biome helps drive the atmospheric circulation in the tropics by absorbing energy and recycling about half of the rain which falls on it. In addition, it is estimated that the region contains almost 10% of the global reserve of carbon stored in land ecosystems.

The Amazon River basin ***has a high water potential.*** It is the world's largest basin and its river is the world's most water filled. The Amazon River Basin covers approximately 6,925,674 km², and it reserves about 15% - 20% of the world's global freshwater supply. It is estimated that the liquid water captured by the basin is between 12,000 and 16,000 km³/ year. However, it has been calculated that the flow of water through the river's various waterways ranges between 5,500 and 6700 km³ / year, since 60% of the water is returned to the atmosphere through evapotranspiration of the Amazon forest, a process which ensures the water balance between land and aquatic ecosystems.

The region is inhabited by ***various groups***: indigenous peoples, African - descendant communities, settlers, coastal residents, urban residents, inter alia.

It is estimated that the population of the Amazon Region amounted to 21,430,115 inhabitants as of the year 2000.

Currently there are about 1,250,000 aboriginal inhabitants, gathered at approximately 420 indigenous peoples belonging to different linguistic groups, with 86 languages, 650 dialects and some 70 tribes with whom no contact has been established as yet. Several African - descendant communities and local communities also reside therein. About 45,000 to 50,000 people can be found in Suriname, grouped into six tribes who still lead a traditional lifestyle, similar to that of West Africa.

One distinctive feature of the Amazon population is its close relationship with nature. Indians, rubber tappers, riverine settlers, etc. have lived for millennia in close association with the diversity of the Amazonian environment, where different human groups have developed many expressions not only of adaptation, but also intervention and modification through cumulative knowledge and practices.

Biodiversity resources have been the basis of local, national, regional and world economies and are used for food, building houses, making tools and utensils for manufacturing (textiles, handicrafts, pharmaceuticals, biotechnology, wood, dye, perfumes, resins, gums, oils, etc.) and also in socio-cultural ceremonies and rituals.

The Amazonian ecosystems also indirectly provide other goods and services essential to humanity, among which the regulation of hydrological cycles, climate regulation (moderation of floods, droughts, extreme temperatures, wind forces), carbon sequestration, oxygen production, soil conservation and erosion control and the control of pests and diseases.

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In spite of all of the above, in this rich and diverse land area, there are different ***pressures and socio-economic dynamics*** which are contributing in varying degrees to the destruction of habitats, disruption and degradation of water flows and population reduction or extinction of species. A study in the biome states that climate change is one of the greatest threats because of its very high impact on the Amazonian ecosystem, followed by human activities such as cattle, mechanized agriculture, infrastructure (hydro and roads), mining, these latter being of high impact. Selective logging, small-scale agriculture and resource extraction are classified as threats with a middle impact[6].

Protected areas have been considered the best strategy for conserving biological diversity. They are an important reservoir of natural capital, cultural and social fields that produce economically valuable goods and services for the subsequent benefit of human populations. Furthermore, since current climate change is a reality *per se*,

6. The process of prioritization on impact of these threats was carried out based on three criteria: i) geographical scope, ii) intensity of impact and iii) urgency (based on growth trends of the activity (WWF 2008).

protected areas are essential in order to mitigate its effects.

The above mentioned arguments were sufficient reasons for the adoption of the ***Program of Work on Protected Areas*** at the seventh conference of parties signing the CBD, aiming at the creation and maintenance of national and ecologically representative and effectively managed regional systems of protected areas. It is sought by means of the aforementioned program that the systems be integrated with a global network of protected areas where human activities are managed so as to preserve the structure and function of the full range of ecosystems, in order to continue to obtain benefits for the present and future generations, and with the ultimate objective of achieving a significant reduction in the rate of biodiversity loss.

In light of all of the above, the main progress in the implementation of the program in the Amazon Biome region is hereby presented.

ON THE PROGRESS IN IMPLEMENTING THE PROGRAM OF WORK ON PROTECTED AREAS (PWPA)

The progress among the countries, which constitute the Amazon Biome in the ***creation of various figures and strategies for conservation of biological and cultural diversity***, is undeniable, although essentially in the land domain. To date about 47% (324,107, acres[7]) of the area covering the Amazon Biome is under some form of protection. Biodiversity conservation is based on the management of national, regional and local protected areas (PA's), indigenous territories and forest management strategies are also considered. Additionally, progress has been made at the regional level in management processes and cooperation for the management of adjacent protected areas.

However, this area faces significant challenges which go beyond the actions of nation states, still requiring a joint regional ecosystem vision. In this regard, in the context of the construction of the Ecosystem Based Vision of Biodiversity Conservation for the Amazon Biome, a regional survey of conservation priorities is currently being conducted, based on national analysis of gaps and identification of conservation priorities, as well as in results of the analysis of priorities (land and freshwater) for the Amazonian Biome, in which organizations as WWF have advanced[8]. It is intended to gradually strengthen this important input, integrating thereby more elements and regional criteria such as representa-

7. The indigenous lands and forest lands are included here, although these categories in most of the Amazon countries are not recognized as legal forms of conservation. However, indigenous lands constitute a great opportunity to supplement the national systems of protected areas in terms of forest land, managing for sustainable use, represents an additional opportunity to maintain a relatively favorable to conservation managed natural ecosystems.
8. The Amazon initiative of the WWF, took into account the following criteria for identification of conservation in the Amazon biome: ecosystem (irreplaceability, connectivity), processes (environmental services, regulation of climate, hydrology) and species (endemism , restricted distribution, endangered species, uniqueness and economic interest).

tiveness, functionality, connectivity and ecosystem integrity and social and cultural variables.

As stated by German Andrade (2008), in order for the Amazonian States to share a vision of ecosystem conservation and regional development, the national strategies need to be based on conservation objectives, focusing on biodiversity, *complementarity* with other elements and variables of cultural and social order with a more integral view to regard the Amazon as an indispensable element for: i) climatic stability, ii) the functionality of water systems (and sub-basin), iii) the conservation of large blocks[9] which are not endangered yet, iv) the conservation of other regional-scale ecological processes (key habitats for wildlife, migration of species, etc.) and v) mitigation of cross – border impacts

On the other hand, any strategy for conservation of the Amazon, should address the fact that human activity in the region is based mainly on the services provided by their ecosystems. Thus, so as to maintain ecosystem services, it is necessary to build *sustainable cultural landscapes* in which there is a venue for conservation (maintenance of relict, biological corridors, agroforestry, etc.).

Similarly, it is necessary to bring conservation to production landscapes and scenarios of infrastructure development through various strategies, among which the following can be included: restoration, afforestation and eco-design of a structure to recover the relics and connectivity protected areas. In terms of conservation and associated infrastructure development, it is urgent to integrate and / or redefine impact mitigation programs through environmental permits, and transnational initiatives. Land organization with conservation components of ecosystems and landscapes can be a viable strategy, as well as a rating system (indicators, variables, methods, models and scales of information) approved for state regional analyses and pressure on ecosystems and regional PA's.

On the issue of ***governance of protected areas***, and considering the elements that collaborate with the description of the state of governance of national systems of protected areas[10], it can be argued that the Amazon countries have advanced in terms of tools and of legal and of institutional rules *that support participation and decentralization in the creation and management of PA's*, although very few of them have managed to build plans which ensure and make this process viable from the national to local levels with clear and complementary schemes which add to the integrated management of PA's. This made intervention possible in these areas, with sectoral activities like mining, petroleum, forestry, among others.

Achievements are quite positive in different national PA systems in terms of new conditions for cooperation and dialogue between government representatives and indigenous communities and peoples of African descent and other local groups, both for planning and the administration and management of PA's. This new trend

9. Defined as those with more than 500,000 ha (*WWF Priority Initiative*).
10. Legal-institutional frameworks; levels of authority and decision making entities, mechanisms of participation, accountability and transparency, land, training and financial sustainability.

includes a variety of methods for managing the PA's that comply with specific realities and contexts. There are several forms of co-operation, and co-management arrangements. However, in some cases, there is confusion about roles and responsibilities in the management of PA's in general and in particular in cases of co-management. This situation leads to conflicts of competence overlapping, gaps in management and failure in accountability.

Regionally, there are similarities between neighboring or cross - border PA's and indigenous peoples living on both sides of the border. While there are concrete experiences of coordination amongst national agencies, indigenous peoples and in some cases, NGOs in the management of these areas, they fail to show significant progress in policies and/or regional integration protocols. This situation makes it necessary to promote dialogue with other agencies and ministries responsible for relations between countries.

With regard *to land tenur*e, there are various forms of occupation: communal and private lands, legalized areas, non legal areas or areas in process of legalization, areas with indigenous communities, Afro - descendant and mestizo peasants. It is common to find various conflicts therein, where the overlap between protected areas and collective lands and extractive industrial activities are most common. There are no appropriate procedures for consolidating the cadastral data, and more often than not do PA's fail to have adequate systems of physical boundaries, which makes its management difficult.

The recognition of rights to land and ancestral territories of indigenous people has had significant progress. In most Amazonian countries deeds have been delivered acknowledging indigenous rights over extensive land areas. However restricted recognition of the right of possession and use of resources for these communities results in limited self - determination definition of their own visions of development. Achieving certification and recognition of ownership has been regarded as a way to ensure greater control over the territories, forewarn natural resources against the expansion of others and secure living venues and cultural continuity for future generations.

In order to aid in achieving real governance and reducing the conflict over the use and occupancy of land and natural resources in PA's, it is necessary to develop and/or strengthen legal frameworks and public policies consistent with the socio-cultural and economic PA systems and the areas of conservation, and participatory processes in the management, planning and land management, integrating collective territories (indigenous, Afro-descendants, etc.) and beyond the economic rationale which is the current basis for development in the region.

Overall, appropriate regional governance policies include, inter alia, enabling transnational processes of dialogue with ministries and other scales and levels of decision making, as well as with local authorities and communities, for these players to participate in environmental management planning and in management of adjacent PA's. Likewise, it shall be necessary to ensure equitable distribution of costs and benefits associated with PA's, recognize the diversity of approaches to governance and greater availability of resources. Permanent processes of technical, operational and financial strengthening are to continue be established, both in state and local levels, if progress is to be

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made in the practice of genuine participation in the creation and management of PA's.

With respect to the ***financial sustainability*** of protected area systems, in general, the funding sources of the countries is the same: the majority of funding comes from state allocations (approximately 75%), followed by international cooperation (about 20%) and self – management revenues which constitute less than 10% of the available resources and most are generated by way of entrance fees to PA's. The resources allocated by States to the biome, range from 20% to 50% of the total resources available for national PA systems, which is a significantly lower amount than the amount currently invested in other biomes.

The analyses of needs and funding gaps have been carried out partly by some Amazonian countries, with varying degrees of progress and methodologies. This makes it necessary to catalyze the most significant developments on the issue of financial sustainability and its various components, so that the Amazon region has a regional analysis of revenues, expenditures and financing gaps and is enabled to select and operate funding mechanisms, as well as a joint funding strategy for the biodiversity conservation of the Amazon.

In a first exploration, conducted within the framework of the process of building an ecosystem vision with the software "System of Projection of Minimum Investments for Conservation" (IMC – from its Spanish language initials), developed by Brazil[11], it was estimated that there have been investments which have amounted to about U.S. $ 200 million in consolidating protected areas in the Amazon region. This investment includes expenditure in infrastructure, equipment, management plans, inter alia. Nonetheless, there is still a gap of investment of about U.S. $ 500 million for all of the protected areas to reach minimum levels of management effectiveness. It was also estimates that the annual demand for the recurring costs of

11. The IMC from its Spanish language initials - Sistema de Proyección de Inversiones Mínimas para la Conservación) is a product generated by a working group of financial sustainability developed and coordinated by the MMA, which had the participation of ICMBio, TNC, CI-Brasil and Brazilian Biodiversity Fund (Funbio). Available on the website of the MMA - Brazil.

protected areas of the Biome, following the above minimum investment, will be approximately $250 million. Currently, the joint annual budgets of the Amazon countries are close to 40% of this amount.

This financial reality of PA's in the region encompasses the challenge of managing scarcity. Consequently, quality in expenditure is essential. In this regard, it is convenient to further integration with the processes of PA management effectiveness and to promote planning processes which yield guidelines for investment according to priorities.

The funding situation for Protected Areas (PA's) and Protected Area Systems (PAS's), initially motivates the identification of barriers and the implementation of strategies in order to achieve the scaling of existing financial mechanisms, particularly those based on payment for environmental services (water, tourism, carbon, etc.) and thence undertake other more innovative and sustainable mechanisms in order to help financial diversification, as well as work on strategies sustainable conservation strategies, designed by means of widely participatory processes. This is accompanied by clear policies and fiscal mechanisms to provide steady income.

It is likewise necessary to strengthen awareness processes at all scales and levels of decision making, to strengthen awareness of the importance of conserving the Amazon ecosystems not only for their natural wealth and their role in climate stability, but also for the environmental services they provide to local economies and national - regional and global development. This will certainly help raise the profile of conservation and attract more financial resources.

In the long term, financial sustainability of PA's in the Amazon shall go beyond ensuring stable and adequate resources to cover their financial gaps. Within a broader view of sustainability, PA's shall provide conditions and a favorable environment for the effective participation of key stakeholders in the region, ensuring their access to the benefits derived from conservation and promoting opportunities for overcoming poverty, the search for equity and sustainable use of resources.

On the issue of ***management effectiveness*** of PA's, although the issue is relatively new, all countries have extensive experience in implementing tools for Management Effectiveness Assessment (MEA). Various tools have been developed, adapted and applied, many of these based on the Framework of the World Commission on Protected Areas (WCPA) of IUCN, which proposes to consider six so – called "moments" in an analysis of effectiveness: context, planning, supplies, processes, products and outcomes. Amazonian countries have emphasized on aspects related to context (state of the area, conservation values, threats and opportunities and political environment), planning and supplies (human resource capacity, financial, and infrastructure) in their analyses.

In order to evaluate the effectiveness of management **at the regional level** (surrounding areas), it is necessary to advance a scheme of permanent exchange of experiences and information and a common methodological framework based on the experiences developed by countries and the international instruments which have been proposed.

Nationally, it is appropriate to value the tools implemented and to define an official

tool to assess management's effectiveness with continuity over time. This would be achieved by strengthening institutions and governance in the management, monitoring and evaluation of PA systems.

On the other hand, efforts should be addressed towards getting other sectors and scales of government and society involved in the implementation of the MEA, so as to facilitate the incorporation of results, not only in planning and management of AP or systems of protected areas, but in other plans, programs and policies of state. In the case of the surrounding areas, it is suggested to work with management plans in the short, medium and long term, and develop greater expertise in the measurement of ecological integrity in protected areas. This could also be an option to leverage financial resources to promote the sustainability of the objects and systems of protected areas.

Overall, despite the fact that the States sharing the Amazon have been very dynamic and committed to the establishment and management of various conservation figures in terms of biological and cultural diversity, this effort is still far behind if compared to the socio – economic pressures and dynamics currently underway. The Amazon is in a process of active transformation[12], with 92,808,200 million hectares modified, especially in the east and southeast (Tocantins basins), the northwest (Andean Amazon and foothills). In this regard, it must be said that the Amazon's biodiversity must be fully integrated into large-scale plans of land use, and there must be proper integration of the economic value of biodiversity in the decisions and policies, and this should be monitored and funded.

On the role of protected areas in the conservation of biological and cultural diversity, these pressures encourage continuity in joining efforts, seeking thereby new alternatives for the conservation of biological and cultural diversity which go beyond the current development style and increase the pace of regional, *effectively managed* protected areas with adequate *political and regulations' support*, as well as *skilled human capital* and of course with *adequate financial resources* for maintenance and expansion.

12. It is estimated that the loss of natural ecosystems has now reached 15% of the region (WWF, *et al.,* 2008).

ON THE FOLLOWING STEPS
in the development of the program of work on protected areas (PWPA) and the vision of biodiversity conservation in the Amazon Biome

Parallel to the review of progress in developing the goals and objectives of the Program of Work on Protected Areas, the thematic working teams of the protected area systems of countries that share the Amazon raised a set of actions which allow in the years to come, for the consolidation of the process of Ecosystem Based Vision of Biodiversity Conservation for the Amazon Biome and the achievement of the purposes of the PWPA at the regional scale. This proposal for a plan of action below was complemented by professionals who make part of the editorial committee and who supported the organization of this regional report. This proposal was also studied and perfected by the Directors of the protected area systems in the Amazon, who stated the strategic actions and deadlines. The strategic actions necessary in consolidating both the vision of biodiversity conservation of the Amazon Biome and of each element of the PWPA are presented bellow. These strategic actions are projected for implementation within a ten (10) year horizon[13].

STRATEGIC ACTIONS
to be implemented in the next 10 years in order to consolidate the process of vision of ecosystem conservation

Table 1. Ecosystem Based Vision of Biodiversity Conservation for the Amazon Biome

Objective: Consolidating a shared eco-systemic approach in preserving the biological and the cultural diversity of the Amazon biome, contributing to the administration and effective management of protected area systems and the maintenance of ecosystem goods and services, integrity, functionality and biome resilience against the effects of natural and anthropogenic pressures and in the context of climate change.
ACTIONS
Identifying the different governmental and intergovernmental venues, international and national NGOs on specific thematic areas and specialties, and other relevant levels of decision making, to socialize the progress in the process of Ecosystem Based Vision of Biodiversity Conservation for the Amazon Biome and regional PWPA, so that commitments are conceived regarding technical and financial cooperation to strengthen the regional work so far developed.
Moving forward with the design and agreement in terms of the action plan to consolidate the process of Ecosystem Based Vision of Biodiversity Conservation for the Amazon Biome, promoting the participation of different stakeholders.
Progressing in processes of national and regional management, to facilitate incorporation into the agenda of governments the issue of regions surrounding PA›s and the process of construction and implementation of conservation vision.
Jointly managing regional projects that enable driving and providing continuity in the process of Ecosystem Based Vision of Biodiversity Conservation for the Amazon Biome, according to the themes promoted.
Consolidating and coordinating the work of the thematic teams built, so that the latter become the technical and the conceptual support that leverages the continuing process of Ecosystem Based Vision of Biodiversity Conservation for the Amazon Biome and the development of regional PWPA.

13. It took a 10-year horizon, consistent with the CBD Strategic Plan. See details of the Action Plan in Chapter III and Annex 2.

Strengthening levels and coordinating mechanisms for regional inter - agencies: REDPARQUES, ACTO, CAN, IUCN, SCBD, as well as support: Academia, NGOs: WWF, TNC, WCS, CI, etc. to facilitate the implementation of the actions proposed within the realm of building an Ecosystem Based Vision of Biodiversity Conservation for the Amazon Biome and regional PWPA.

Identifying similarities between the building of the Ecosystem Based Vision of Biodiversity Conservation for the Amazon Biome with other regional initiatives such as the Biodiversity Action Plan for the ACTO, the BIOCAN (biocide) program of the Andean Community of Nations, Amazonian Guianas› Shield Initiatives AVINA, Amazon Andes of USAID, the WWF›s Amazon Initiative, among others, to manage regional cooperation work that articulates actions of common interest.

Table 2. Strategic Actions for Meeting the Objectives of the PWPA at the Regional Scale / 2010 - 2020

Elemento 1: Pursuing actions in planning, selecting, creating, strengthening and managing systems and protected area sites

Objective	Goal	Strategic Action
1.1. Creating and strengthening national and regional protected area sites integrated in a worldwide network, as a contribution to the worldwide agreed goals.	By 2010, the land area and 2012 in the marine area, a global network of national and regional comprehensive, representative and effectively managed protected areas will have been created as a contribution to (i) the goal of the Convention›s Strategic Plan and World Summit on Sustainable Development to achieve a significant reduction in the rate of biodiversity loss by 2010, (ii) the Millennium Development Goals - particularly goal 7 on ensuring environmental sustainability, and (iii) Global Strategy for Plant Species Conservation.	Achieving an agreement on goals and priorities for the conservation of biological and cultural diversity from a regional perspective and starting the planning action processes in the priority areas.
1.2 Integrating protected areas in wider landscapes and seascapes so as to maintain ecological structure and function.	By 2015, all protected areas and protected area systems will have been integrated into the landscapes and seascapes and broader relevant sectors, applying the ecosystem approach and taking into account ecological connectivity and the concept, where appropriate, of ecological networks.	Strengthing the process of setting portfolio priority conservation areas from a regional perspective, integrating landscape of terrestrial and freshwater areas, as well as other criteria and socio-cultural and economic elements.
1.3 Building and strengthening regional networks, cross boarder protected areas (TBPAs) and collaborating among protected areas across adjacent national boundaries adjacent.	2010/2012 to establish and strengthen cross boarder protected areas, other forms of cooperation between neighboring protected areas across national boundaries and regional networks.	Make progress in national and regional management processes so as to facilitate incorporation into the agenda of governments the issue of cross boarder PA's and formalize multilateral agreements between adjoining protected areas.
1.4. Improving substantially the planning and management of protected areas based on the site.	By 2012, all protected areas will have effective management based on site planning processes with venues that are very participatory and scientifically sound to which they incorporate clear objectives, targets, management strategies and monitoring programs of biological diversity, building on existing methodologies and a long term management plan which involves stakeholders.	Developing, strengthening and harmonizing integrated management plans and protected areas management with a regional focus, with an adaptive vision, long term and also including the monitoring and evaluation systems in managing and handling them, as well as biological and cultural diversity.
1.5. Preventing and mitigating the negative impacts of major threats to protected areas.	By 2008, effective mechanisms will have been established so as to identify and avoid or mitigate the negative impacts of serious threats to protected areas.	Progressing in regional processes of analysis, modeling, prevention and mitigation of impacts on the development of PA extractive activities, infrastructure, climate change, agricultural expansion and all other development activities.

Elemento 2. Governance, participation, equity and share in benefits		
Objective	**Goal**	**Strategic Action**
2.1. Promoting Equity and participation in benefits.	Would have establish by 2008 mechanisms for equitable participation in terms of both costs and the benefits arising from the establishment and management of protected areas.	Studying, evaluating and promoting the involvement of different players, strategies, figures and tools for conservation and management of biological and cultural diversity and other natural resources to show alternatives that enable effective management and conservation of areas of biological, cultural and economic importance.
2.2. Intensifying and strengthening participation of indigenous and local communities, as well as all pertinent stakeholders.	By 2008, there shall be full and effective participation of indigenous and local communities, while fully respecting their rights and recognizing their responsibilities, consistent with national laws and applicable international obligations, plus the involvement of other relevant stakeholders in managing existing protected areas.	Sharing experiences to facilitate and to strengthen participatory processes and communication with local communities, indigenous populations and peoples of African descent, as well as other players involved in the creation, the management and the planning of protected areas.
Elemento 3. Actividades favorables		
3.4. Ensuring financial sustainability of protected areas and national and regional systems of protected areas.	By 2008, There shall be sufficient resources to cover the costs of implementing and effectively managing national and regional systems of protected areas, both national and international sources.	Developing a comprehensive analysis at regional level (based on estimates and tools implemented by countries) on financing needs and defining and managing a regional strategy for financial sustainability for protected areas of the Amazon biome.
Elemento 4. Normas, evaluación y supervisión		
4.2. Assessing and improving the effectiveness of protected area management.	By 2010, there shall be frameworks for monitoring, assessing and reporting related to the effectiveness of site management and national and regional systems of protected areas and cross boarder protected areas. They shall also be adopted and implemented by the Parties.	Advancing in the learning process, the concepts, the information exchange and the systematization as well as the analysis of results of EEM at different levels, identifying strengths and weaknesses that contribute to effective management of protected areas in the Amazonian biome.

Chapter 1

The Amazon Biome: general context

AMAZON BIOME. LOCATION AND EXTENSION

The Amazon region is located in South America. It is shared by nine countries: Brazil, Peru, Colombia, Bolivia, Venezuela, Ecuador, Guiana, French Guiana and Suriname (Figure 1). Brazil is the State which occupies the largest area of the Amazon and South America. The extension of the Amazon varies according to the criteria and interpretation used, ranging from 5,147,970 km^2 to 8,187,965 km^2. UNEP et al 2009, interprets the length of the Amazon considering the ecological criteria (biome, tropical rainforest), hydrographic (basin) and political administration. Table 3 illustrates the surface of the Amazon based on these criteria. Moreover, Mittermeier *et al.*, 2002, define the extent of the Amazon Biome based on ecoregions (34) identified by the WWF, which cover an area of 6,683,926 km^2 and include French Guiana (90,000 km^2) representing 1, 3% of the total area under this definition.

Figure 1. Location of the Amazon Region

Table 3. Extension of the Amazon region based on criteria

Country	Extension of the Amazon region according to hydrographic criteria (km²)	Extension of the Amazon region according to ecological criteria (km²)	Extension of the Amazon region according to political administrative criteria (km²)	Total Extension of the Country (km²)	Percentage of Amazon Region Extension per Country (%)	Percentage of Country Extension in the Amazon Region (%)
Bolivia	724.000	410.423,74	724.000	1.098.581	9,8	65,9
Brazil	3.869.953	4.053.430,48	5.034.740	8.514.876	67,9	59,1
Colombia	345.293	543.890,87	477.274	1.141.748	6,4	41,8
Ecuador	146.688	119.851,09	115.613	238.561	1,6	40,8
Guiana	12.224	240.272,43	214.960	214.960	2,9	100
French Guiana		84.000		84.000		100
Peru	967.176	782.786	651.440	1.285.216	8,8	50,7
Suriname	-	160.895,85	142.800	142.800	1,9	100
Venezuela	53.000	458.649,23	53.000	916.445	0,7	5,8
TOTAL	6.118.334	6.850.781,49	7.413.827	13.598.187	100	

Sources: PNUMA *et al.*, 2009; Ecological Criteria, Amazon Biome selected from Olson, D. M. and Dinerstein, E. (2002). The Global 2000: Priority ecoregions for global conservation. Annals of the Missouri Botanical Garden Volume 89: 199-224

AMAZON BIOME. BIOLOGICAL DIVERSITY

The Amazon region is considered one of the largest wild areas in the world: it concentrates high land and freshwater ***biodiversity***, and as for forests, only the boreal forests in Russia, Canada and Alaska outsize it. The Amazon Region represents 53% of the world's tropical rainforests, it has the largest river system on earth and generates about 10% of the terrestrial net primary production (Mittermeier *et al.*, 2002).

The climatic, geological and geomorphological factors and processes generate environments with different drainage systems and soil qualities, which lead to differentiation of the composition and structure of ecosystems. Different forest types can be found in the Amazon region, amongst others: flooded forests[14], firm land rain forest[15], medium - sized deciduous forests in transition areas, the babassu palmettos, forests with prevalence of liana as well as low and high montane forests. Other non - forest elements of vegetation are savanna lands or fields, flooded savannas, shrub vegetation and the various sub - alpine vegetation types (Mittermeier *et al.*, 2002). The diversity of the Amazon forest can have 150 to 312 species of trees per hectare (Bustamante, 1988, Brown, 1990; Gentry, 1990).

The complexity and variety of aquatic ecosystems and areas of flooded forests contribute to the Amazon region being the most diverse freshwater ichtyofauna of the world. Over 3000 species of fishes have been described, but it is estimated that this value can be up to 9000 species (Mittermeier *et al.*, 2002).

The Amazon region does not compare to any other wild area in the world in terms of biological wealth and endemism[16]. Six countries sharing the Amazon are considered to be mega - diverse. A third of the known vascular plants worldwide live In Brazil, Colombia and Peru. Brazil has the largest land area of the continent and is the country with the greatest number of species of plants, mammals, birds, reptiles and amphibians. Colombia, Peru and Bolivia are next in biological importance (Table 4). Peru has the highest number of species of butterflies worldwide (4200) and 20% of the birds on the planet.

14. Brown and Prance (1987) record seven (7) types of flooded forest in Amazonia: seasonal *várzea* (white-water flooded forest), permanent *várzea*, tidal zone *várzea*, seasonal *Igapó* (forest flooded by sewage or crystalline) *permanent Igapó*, mangroves and floodplains (Mittermeier *et al.*, 2002).
15. It accounts for approximately 51% of the Amazon Jungle.
16. Da Silva, Rylands and da Fonseca (2005) identified 8 major areas of endemism for terrestrial mammals in the Amazon: Napo, Imeri, Guiana, Inambari, Rondonia, Tapojos, Xingu and Belem. Four of these sites are completely in Brazil and the rest in other countries.

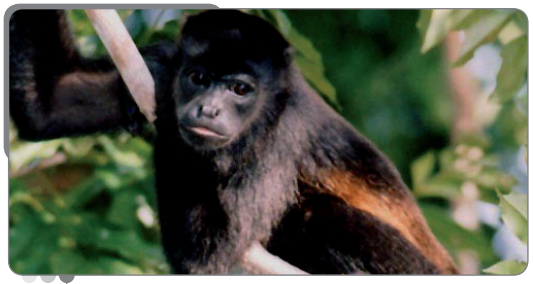
Table 4. Number of species reported by countries and groups in the Amazon basin

Countries * / Basin **	Plants	Mammals	Birds	Reptiles	Amphibians
Bolivia	20.000/nd	398/nd	1400/nd	266/nd	204/nd
Brazil	55.000/30.000	428/311	1622/1300	684/273	814/232
Colombia	45.000/5950	456/195***	1875/988***	520/192***	733/140***
Ecuador	15.855/6249	368/197	1644/773	390/165	420/167
Guiana	8000	198	728	137	105
French Guiana	4500	188 (without cetaceans)	167	167	134
Peru	25.000	515/294*	1816/1200*	418/208*	449/220
Suriname	4500	200	670	131	99
Venezuela	21000/nd	305/nd	1296/nd	246/nd	183/nd
Amazon Basin	40.000	427	1294	378	427
Endemism in the Amazon Basin	30.000	173	260	216	384
% of Endemism in the Amazon Basin	75	40,5	20	57	90

na: not available for the Amazon in countries with territories beyond the region.
Resources: *UNEP *et al.*, 2009; **Mittermeier *et al.*, 2002; ***Arévalo *et al.*, 2008, Regional Directorate of the environment of French Guiana, with validation of the Scientific Council of the Regional Natural Heritage in 2010 for animal groups. TCA (1995) Use and conservation of wildlife in the Amazon. Natural History Museum of Peru. GTZ - Peru (2008). Peru: mega - diverse country.

The Amazon Basin is the largest photosynthetic reserve and the most diverse gene bank in the planet. There is the greater amount of living matter per unit area of the world. Whereas there are, in temperate forests, from 60 and 140 tons of living material per hectare, there are records of between 160 and 510 tons per hectare of living matter in the Amazonia.

Some emblematic wildlife species in the Amazon



The Amazon has the largest concentration of primates on Earth (15 genera, 81 species and 134 taxa. Of these an entire family is endemic (Pitheciidae).

© Alto Fragua Indi Wasi, archivo Parques Nacionales Naturales de Colombia

The Anaconda (*Murine Eunectes*) is the heaviest snake in the world and competes with the burmese python for the title of the longest.

© Bruno Pambour / WWF-Canon

The Giant Otter (*Pteronura brasiliensis*) is the largest in the world (1,5 – 2 m.). Its fur, similar to that of the jaguar, is highly valued.

© André Bärtschi / WWF-Canon

Among birds, psitacids (parakeets, parrots, parrots, macaws, and relatives) are perhaps the most emblematic species. In total, about 57 species are have been recorded, of which 20 are endemic.

© Zig Koch / WWF

The Amazon appears as one of the 5 regions with most biodiversity in chelonians on Earth. There are 21 species in total, and 7 of there are endemic. The Charapa Turtle (*Podocnemis expansa*) is one of the biggest turtles in the world.

© Edward Parker / WWF-Canon

Dendrobatidae toads, particularly the blue poisonous toad, es highly toxic and it is used for poisoning darts. This toad is emblematic of the Suriname biodiversity.

© André Bärtschi / WWF-Canon

Crocodilians reach their highest diversity in the Amazon region. Amongst these, the black cayman (*Melanosuchus niger)* is one of the biggest crocs of the planet (6-8 meters).

© Michel Roggo / WWF-Canon

The pirarucú (*Arapaima gigas*), is one of the biggest freshwater fish of the world.

© Michel Roggo / WWF-Canon

Source (texts): Mittermeier *et al.*, 2002

Data on the importance of wildlife in Peru

In the Peruvian Amazon there are about 13,100 tons of meat of wild animals and about 80,000 tons of fish are used for human consumption yearly. Studies in the valleys of Pachitea, Ucayali and Pichis, between 1966 and 1981, show that daily per capita consumption of fish ranged between 135.6 and 279.6 gr. and from 52 to 460 gr. bushmeat in the rural areas.

Fisheries contribute, on average, with 44.8% of protein consumption and the hunting of wild animals represents 19.9%. The value of wildlife for the Peruvian Amazon is estimated at more than 19 million U.S. dollars and an average of $ 8 per capita for direct use (ACTO, 1995).

Sea fishing contributes with more than 57,000 jobs, while in the Amazon, an estimated 45,000 families depend on artisanal fishing.

The Society in general has found in the biodiversity of the Amazon resources to meet different needs. The Amazon region's resources have been used for food, housing, making tools and utensils for manufacturing (textiles, handicrafts, pharmaceuticals, biotechnology, wood, dye, perfumes, resins, gums, oils, etc.), as well as sociocultural ceremonies and rituals (Tables 5 and 6).

The Amazon region's ecosystems also indirectly provide other goods and services essential to humanity among which are the regulation of hydrological cycles, climate regulation (moderation of floods, droughts, extreme temperatures, wind flows), carbon sequestration, oxygen production, soil conservation and erosion control and the control of pests and diseases.

Noteworthy contributions are to be highlighted to national and regional economies and the world of biodiversity of the Amazon. Items made of rubber, cocoa-based food products (chocolate), pharmaceutical remedies, insecticides, among others, have their origin in the Amazon biome (Figure 2).

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Figure 2. Some products of the Amazonian Biodiversity which have contributed to national and global economies

Table 5. Some Amazonian fruits of economic potential

Common Name	Scientific name	Potential use
Arazá	*Eugenia stipitata*	The ripe fruit is used in the preparation of juices, nectar, jam, jelly, ice cream, cakes, cocktails and wine. It also has potential in the production of dried fruit and extraction of essential oils
Camu-camu	*Myrciaria dubia*	Its huge market potential lies in the high ascorbic acid content which is obtained from the fruit's pulp.
Canangucha	*Mauritia flexuosa*	The main use of the fruit is as a meal. Almost pure starch - edible flour is obtained from the trunk's medulla and palm is obtained from the fruit's terminal meristem
Cocona	*Solanum sessiliflorum*	The pulp and mucilage from seeds of the ripe fruit are edible and are used in the preparation of juices, soft drinks, ice cream, candy, syrups, salad and pickles. In industry, it is used in the preparation of nectars, jams and jellies
Copoazú	*Theobroma grandiflorum*	Domestic or industrial preparation of soft drinks, juices, desserts, sweets, ice cream, cakes, candies, jellies, juices, jams, yogurt, and pizza. A byproduct of the fruit is the seed, which is used in the development of «cupulate» powder. Fat is obtained from this product which is then used in the preparation of cosmetic creams with unproven attributes of «skin rejuvenation»
Maraco	*Theobroma bicolor*	The fruit is consumed in its natural state or used in the preparation of soft drinks and ice cream. The seeds are also used in confectionery shaped like almonds and chocolate making. The wood is used as fuel
Amazon Pineapple	*Ananas comosus*	Wide use in cooking and preparation of soft drinks, ice cream, sweet and fermented beverages. The pulp is used industrially in the manufacture of preserved preparations and jam, juice and concentrate. The main products manufactured are: juices, nectars, jams, slice in syrup, canned juices pulp-shell-core, frosted pieces, wine and vinegar. The industry products are used in the manufacture of alcohol, sugar and cattle feed. In traditional medicine, the pulp is used in the treatment of colds, urinary retention, kidney pain, dyspepsia, diphtheria and other conditions to the throat, is an excellent suppurative. The juice of the unripe fruit is astringent and anthelmintic. The leaves in the mesophyll, contain fibers of varying size, strong, tough and white, which are used in fine textiles of high commercial value
Chontaduro	*Bactris gasipaes*	Edible. Edible oil is also extracted from the fruit, which contains unsaturated fatty acids in high demand in the market today. In industry, the mesocarp is cooked, canned in brine. The endosperm of the seed is edible and tastes like «coconut» is rich in oil, is also used in baking (Cabrera and Vega, 1999)

Source: Ruiz S.L. *et al.*, 2007

Table 6. Some biological resources of the Amazon with recovery potential using modern technologies

Appeal	Chemicals	Attributes	Industrial application sectors
Bixa orellana (Achiote)	Pigments	Food (condiments), industrial dye	Food industry
Banisteriopsis caapi (Ayahuasca)	Betacarbonilos, harmine, harmilina	Psychotherapeutic treatment	Pharmacist
Capsicum spp. (Ajíes)	Caprisicum acid (alkaloid), ascorbic acid, antioxidants	Flavors, antiseptics	Food, nutraceutical
Eugenia stipitata (Arazá)		Relieves stomach pain, cold	Pharmacist
Myrciaria sp. (Camú Camú)	Ascorbic acid	Micronutrients	Nutraceutical
Baccharis sp. (Chilca)		Antirheumatic	Pharmacist
Erytroxylum coca (Coca)	Alkaloids, vitamins and minerals	Stimulating, pharmacist (vasodilator), anti diarrheal, nutrition	Pharmaceutical, oral health
Gosyppium sp. (Algodón)	Pigments	Textiles	Industry
Annona sp. (Chirimoyas, the region recorded A. hypoglauca)	Vitamins B and C, calcium, phosphorus	Micronutrients	Food
Plantago major (Plantain)		Treatment of renal disorders	Pharmacist
Carica papaya (Papaya)	Vitamins A and C	Vitamins, detoxification of the skin, internal organs purifying, healing	Pharmaceutical, food
Chenopodium ambrosioides (Paico)		Relieves stomach pain, diarrhea and colds	Pharmacist
Canna sp. (Achira, the region reported C. indica and C. jaegeriana)	Starch (large grains)	Starch industry	Industry
Lechleri Croton (Dragon›s Blood)	Proantocianidas (catechin, epicatechin, gallocatechin, Taspinar-alkaloids, and phenols)	Antiviral, influenza, herpes 1 and 2, hepatitis A and B, healing, treat ulcers	Pharmacist
Borrago officinalis (Borraja, muy usada pero originaria de Asia, NorAfrica y Europa)	Mucilages (flowers), oils, resins, allantoin and saponins (leaves and stems)	Antitusígeno, expectorante, diurético, antirreumático, tratamiento de varicela, sarampión, furonculosis	Pharmacist
Annona muricata (soursop)		Micronutrients	Food

Source: Ruiz S.L. *et al.*, 2007

AMAZON BIOME: HYDRIC IMPORTANCE

The Amazon River basin has a high hydroelectric **potential**; it is the world's largest river, as well as it has the most flow. The Amazon River basin covers approximately 6,925,674 km², from its source in the Peruvian Andes, on the slopes of the Mismi Snowy Peak at 5,600 feet, until its mouth onto the Atlantic Ocean[17].

The Amazon River basin reserves about 15% - 20% of the global freshwater supply. It is estimated that liquid water captured by the basin is between 12,000 and 16,000 km³ / year, however, it has been calculated that the flow of water through the various waterways ranges between 5,500 and 6700 km³ / year, as 60% of water is returned to the atmosphere through evapotranspiration of the Amazon forest, a process that ensures the water balance between terrestrial and aquatic ecosystems (UNEP *et al.*, 2009).

The most important tributaries of the Amazon River have their origin in the Andes; the other tributaries come from the Guyanese and Brazilian highlands and sectors bordering the Orinoco basin in Colombia. The basin has been called the "freshwater sea" because its water incursions tens of kilometers to the Atlantic Ocean. The mouth of the Amazon river delivers 15% of all freshwater inputs of all the rivers of the world who come to the oceans (Table 7) (Amazon Committee on Development and Environment, 1994).

Table 7. Mouths of the world's largest rivers

River	Total	Percentage
Amazonas	175.000	14,97
Congo	40.000	3,4
Orinoco	36.000	3,06
Mississippi	17.000	1,44
Other rivers	907.000	77,13

Source: Amazon Committee on Development and Environment, 1994.

There are three types of rivers in the basin, with different physical - chemical and biological features: white, black and clear or crystal rivers (Sioli, 1984). *White-water* rivers are of Andean origin. These waters are the richest in nutrients and aquatic resources. *Black-water* rivers contain little sediment; they are acidic (pH below 4) and poor in electrolytes. The dark color is due to the presence of humic and fulvic acids by incomplete decomposition of organic matter. *Clear-water* rivers are generally transparent and green, and carry little sediment can vary considerably in their physical - chemical characteristics, with pH between 4 and 7, depending on the geological substrate. Amazon Lakes are also found, which originate from the tributaries of the rivers and show significant variations in the physical - chemical composition of the water, usually associated with tributaries (Forsberg *et al.,* 1988).

17. As for the length of the main river, there is no consensus, some authors cite 6,762 km.(Amazon Committee on Development and Environment - Amazonia without myths, 1994), other 6992.06 km. (National Institute for Space Research – INPE - 2008 - Brazil).

AMAZON BIOME: INHABITANTS AND EXPRESSIONS OF THEIR CULTURAL DIVERSITY

From a cultural standpoint, the Amazon is one of the most diverse regions of the planet. The region is inhabited by various groups: indigenous peoples, Afro-descendant communities, settlers, coastal residents, urban residents, among others.

The number of inhabitants of the Amazon region is determined by the criterion of demarcation and extension of the region. Mittermeier *et al.*, 2002, estimates that in the Amazon the population stood at 21,430,115 by the beginning of the year 2000; the report of UNEP *et al.*, 2009, stated 38,777,600 and 11,037,260 inhabitants in 2005[18]. Table 8 shows the population data and growth rate of the Amazonian countries to the 80's, 90's and the first decade of 2000 respectively. According to these reports, the inhabitants of the Amazon, in the first half of the decade 2000, amount to 33. 243,671. Brazil accounts for at least 75% of the population, followed by Peru. The average annual growth rate of the local population for the period 1990 - 2007 corresponds to 2.3%. French Guiana has the highest growth rate of 3.8%, followed by Ecuador.

Table 8. Population and growth rate in the Amazon

Country	Population			Growth Rateaverage	
Bolivia		1992	2001		1992-2001
		606.530	805.101		3,2
Brazil	1980	1991	2007	1980-1991	1991-2007
	11.015.363	16.146.059	24.970.600	3,5	2,8
Colombia	1985	1993	2005	1985-1993	1993-2005
	452.897	753.963	960.239		
Ecuador	1982	1990	2005	1982-1990	1990-2005
	263.797	372.533	629.373	4,4	3,6
Guiana	1980	1991	2002	1980-1991	1991-2002
	759.568	723.673	751.223	-0,4	0,3
French Guiana	1982	1999	2006*	1982-1999	1999-2006
	73.022	157.213	202.000	4,6	3,8
Peru	1981	1993	2005	1981-1993	1993-2005
	1.253.355	3.542.39	4.361.858	9,0	1,38
Suriname	1980		2004		1980-2004
	354.860		492.823		1,38
Venezuela	1981	1990	2001	1981-1990	1990-2001
	45.667	55.717	70.464	2,2	2,16

*Estimated figure

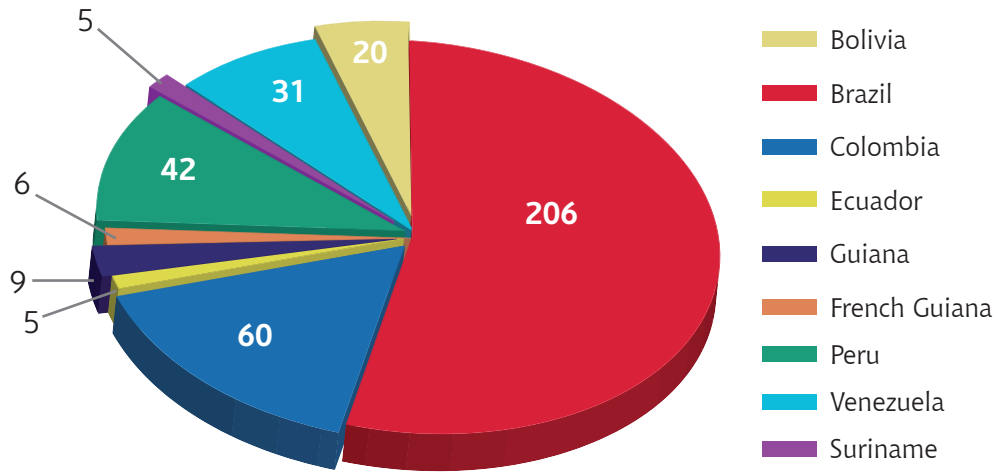
Sources: UNEP *et al.*, 2009, Centre Des Amazon, Colombia node. (2007) and calculations for this paper, INSEE 2010, French Guiana.

18. If reference is made to what is called Major Amazon in said document, which comprises an area of 8,187,965 km² and minor Amazon (5,147,970 km², respectively. These numbers result from the combination of ecological, political, administrative and hydrographic criteria.

It is not known with certainty when the first settlers arrived at the Amazon region; several studies suggest that the region began to be settled about 12,000 to 15,000 years ago. Others say that America was occupied by various routes at least 40,000 to 50,000 years ago. (Mittermeier *et al.*, 2002).

According to archaeological research, the origins of America's most advanced cultures can be found in northwestern South America, Colombia and Ecuador. Intensive agriculture, as well as life in settlements of 10 to 50 thousand inhabitants, was originally developed in the Amazon jungle, particularly on the banks of the Amazon River and its major tributaries.

The current configuration of the Amazon is a product of various processes of occupation, especially from Europe (XVI and XIX). It is said that by the time the first Europeans arrived in the Amazon, the indigenous population was 3 to 5 million, seated especially in the margins of the main rivers (Mittermeier *et al.*, 2002). Currently there are about 1,250,000 aboriginal inhabitants, gathered at approximately 420 indigenous peoples belonging to different linguistic groups[19], with 86 languages, 650 dialects and some 70 tribes with whom no contact has been established as yet. These ethnic groups are located mainly in Brazil, Colombia and Peru (Graph 1) (UNEP *et al.*, 2009)[20].



Graph 1. Indigenous Groups in the Amazonian countries.

Source: Mittermeier *et al.*, 2002

19. The major language groups identified are: Tupi , ye or ge languages. The Tupi language family is more widespread in the Amazon region; the Caribbean language, which probably spread from the northern part of the Amazon, although there are members of this language family in the central Amazon region; the Arawak language group is located in the surrounding Amazon region itself ; and the pano-tacanas languages.
20. 50 still unknown ethnicities are reported in Brazil as of the year 2000, and about 24 unknown ethnicities in Peru (Mittermeier *et al.*, 2002).

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In Suriname and Guiana there are not only diverse indigenous groups inhabiting the Amazon region, Afro-descendant communities also reside therein. There are about 45 to 50,000 African – descendant inhabitants in Suriname, grouped into six tribes who still lead a traditional lifestyle similar to that of West Africa.

One distinctive feature of the Amazon population is its close relationship with nature. Indians, rubber tappers, riverine settlers, etc. have lived for millennia in close association with the diversity of the Amazonian environment, where different human groups have developed many expressions not only of adaptation, but also intervention and modification through cumulative knowledge and practices.

The worldviews and indigenous traditions are full of references, symbols and meanings related to the species and biological processes. In the south of the Colombian Amazon, to bring up one case, the relationship between culture and biodiversity is expressed and synthesized in three dimensions of Indian life: the *maloca*, the chagra and the rituals (Ruiz *et al.* 2007).

The ***maloca*** is the expression and synthesis of the ancient order and indigenous knowledge; every part of the maloca, each pole, each object has a story, a reference, which connects to the life of plants, animal life and the history of human beings.

It is a living space which is always in a continuous process of construction that is built through daily talks at the *mambeadero*[21] and the development of different rites by which the maloquero[22] gradually establishes and strengthens relations with his social and natural environment (De la Hoz, 2005).

The **chagra** is the space where the relationship between nature and society, ritualized in the maloca, are extended and consolidated. The chagra expresses the knowledge and technologies acquired by the Indians in their relationship with the environment for survival and their projection in time. It is based on the agricultural management of biodiversity, after logging and burning forest area, which does not exceed an acre. In this space there is a division of labor; women mainly manage short-cycle crops and foods and prepare food derived from cassava and other plants. Men are in charge of logging, burning and handling some crops such as coca, tobacco and fruit trees, as well as hunting, fishing and gathering berries. The chagra, besides reserving what is known as the most adequate management to maintain balance in forest regeneration, also contains the dimension of knowledge accumulated over time on resources, crop management, its history; that is to say the continued breeding and testing of each species kept in a small domesticated forest borrowed from nature (Centre for research, training and information to the Amazon Service, PRONATA, Sf).

21. The *mambeadero* is a highly ritualized male space where men gather to chew mambe and ambil.
22. Name by which the manager or owner of the *Maloca* is known.

Rituals rebuild and revitalize both the order of nature, as the social order. Rituals are very important moments, since it is through these rituals that people with the necessary knowledge can restore relations with spiritual beings and thus cure their territory, thus ensuring the chances of good harvests, hunting prey, and which results in the ability to continue to live in good health within the traditional territory (Ruiz *et al.* 2007).

AMAZON BIOME: TRANSFORMATION PROCESS AND CORRIDORS

In this rich and diverse land area, different socio-economic pressures and dynamics that are contributing in varying degrees to the destruction of habitats, disruption and degradation of water flows and the reduction of stocks and / or extinction of species are also present.

Habitat destruction is largely driven by mechanized activities of agriculture and livestock increased by climate change and the intensive exploitation of the forest. Degradation and disruption of water flows is a result of water and mining infrastructure development, as well as exploration and exploitation of hydrocarbons and, to a lesser extent, by sewage and population reduction and extinction of species, attributed essentially to the unsustainable exploitation of wood and other forest products, as well as land and aquatic wildlife. Table 9 shows the results of an analysis, prioritization and management of the biggest threats in terms of its impact on the Amazon region ecosystems. This prioritization was carried out based on three criteria: i) geographical scope, ii) impact

Table 9. Relative importance of threats, based on their impact

Amenazas	Impacto sobre los ecosistemas
Climate Change	Very high
Cattle Rearing	High
Mechanized Agriculture	High
Water Infrastructure[23]	High
Mining	High
Selective logging	Medium
Small-scale agriculture	Medium
Exploration and exploitation of hydrocarbons	Medium
Non-timber resource extraction	Medium
Water resource extraction	Medium
Waste disposal - sewage disposal	Low

Source: WWF, 2008

23. For Guiana, the road infrastructure (road construction), also represents a major threat to biodiversity and protected areas. Similarly, in the case of the Brazilian Amazon region, road building stands as a major cause of deforestation.

intensity (e.g. full versus partial destruction of the conservation objectives) and iii) the urgency (based on growth trends of the activity (WWF 2008).

Climate change

Climate change is regarded as the first threat to Amazon ecosystems. A study by an international team of scientists from Oxford University, the Potsdam Institute and others, concludes that the Amazon rainforest is the second most vulnerable area of the planet to climate change impacts, after the Arctic (UNEP & ACTO, 2009).

According to historical records for the Amazon biome, there was a warming trend of +0.63 °C over a period of 100 years (Victoria *et al.*, 1998) which caused severe droughts that devastated the Amazon in the twentieth century, and in 1925 - 1926, 1961, 1982 - 1983 and 1997 - 1998, all attributed to El Niño phenomenon[24], increasing fire and causing serious effects on the population. More recently, Malhi and Wright (2004) estimated that the warming in the tropics is in the order of 0.26 ± 0.05 °C per decade since the seventies.

In 2005 another type of abnormal climate caused drought in the west, south, central and eastern Amazon, as in years of El Niño. Studies indicate that the abnormal warming of almost 1°C in the tropical North Atlantic was responsible for this climate abnormality (Artaxo, 2006). This brought about a significant reduction in the level of some major rivers in the region, as the Solimões, Madeira, Purus and Acre Juruá, suspending thereby navigation in various areas. This drought also favored fire, recording a 300% increase in fires in 2005 (Marengo, 2006). Importantly, forest fires, along with deforestation, released to the atmosphere hundreds of millions of tons of carbon dioxide each year, contributing to global warming (Nepstad, 2007).

This trend to the increase in drought and heat in the Amazon could be strengthened by the death of the rainforest in the eastern Amazon, being replaced by forest and semi-arid savannah vegetation. According to Nobre et al (2005), this could turn the Amazon into savannah in 60% of its territory in this century, also affecting the biodiversity found in this biome. Miles et al. (2004) for example estimate that 43% of tree species may become extinct.

In this regard, according to Salazar (2009), studies with different methodologies, have pointed to the south and east of the Amazon as the most vulnerable regions to the process of modification of the rainforest and other vegetation of smaller size with a capacity of adaptation to hot and dry climates (such as savannas) on various climate change scenarios. Pioneering studies such as Cox *et al*. (2000, 2004) showed that increasing emissions of anthropogenic CO_2 could lead to an imbalance between emission and carbon sequestration, especially in the Amazon.

Increased atmospheric CO_2 concentration favors, on the one hand, the increase in biomass, and secondly, the temperature increase, leading to increased soil and plant respiration. From the atmospheric point of view, the increase in CO_2 sequestration by plants is a negative feedback mechanism (by increasing atmospheric CO_2 sequestration by plants increases and then the CO_2 tends to decrease) and increased breathing is a positive feedback mechanism (by

24. Periodic climate phenomenon which presents, as one of its characteristics, the abnormal warming of the Pacific waters near the coast of Ecuador and Peru.

increasing atmospheric CO_2 increases the temperature and therefore the plant respiration and CO_2 tends to increase).

With the increasing anthropogenic emissions of CO_2 at a given time, the photosynthetic rate would reached its upper limit and from that point on, the temperature increase would lead to the emission of CO_2 being greater than carbon sequestration. Subsequently, the biomass the forest would decline and the concentration of CO_2 would increase further. In this study, midway through century the Amazon rainforest would from being a CO_2 "sink" to being a source of CO_2, and by the end of the century, the temperature increase would be much higher than projected without considering these complex feedback mechanisms. These processes could lead large areas of the Amazon to be replaced by savanna vegetation. Salazar *et al*. (2007) found that, by the end of the century, some parts of the Southeast of the Amazon could be replaced by savanna vegetation, mainly due to increased evapotranspiration and a decrease in the amount of water in the soil. Such study was conducted by using a potential vegetation model and results of 15 participants in the IPCC models.

Other studies (Friedlingstein *et al*. 2003; Gullison et al. 2007) draw different conclusions regarding the behavior of the carbon cycle in the jungles, when subjected to increased temperature and increased CO_2 concentration. This variety of results indicates that this important and relevant scientific issue of the response of vegetation to elevated CO_2 concentration needs to continue to be studied using models which represent a coupled system between the different components of the climate system, which should include the modeling of biogeochemical cycles and the adaptation mechanisms of the forest to drier conditions (Salazar, 2009).

In addition to affecting terrestrial ecosystems, climate change threatens Amazon aquatic ecosystems which play an important role in the water cycle and water balance in the region. The main consequences of climate change on these ecosystems are given by (i) water temperature increase, which impacts on some species of fish and other animals, (ii) changes in nutrients in the rivers due to altered forest productivity, which affects aquatic organisms, and (iii) higher levels of sedimentation and siltation in the channels of the rivers originating in the Andean foothills (Secretariat of the Convention on Biological Diversity, 2009).

Changes in the state of the climate are causing further impacts on communities. These vary in magnitude according to the size, density, location and welfare of the population. The deaths and mortality rate (caused by infectious diseases, health problems and damage to sanitary infrastructure) have increased as a result of heat waves, droughts, fires and floods. Although many models have analyzed urban populations, which are particularly vulnerable to extreme temperatures due to conditions of poverty and conditions of the housing solutions (overcrowding and poor ventilation), effects on rural populations are different and still poorly studied. In addition, climate change has increased insect infestation and the spread of disease.

In South America, malaria, leishmaniasis, dengue, Chagas disease and schistosomiasis are the major vector-borne diseases sensitive to climate. Other diseases include yellow fever, plague, Venezuelan equine encephalitis and several arboviral diseases detected in the Amazon (e.g., Oropouche fever). As a result of the drought caused

by El Niño events, the populations of Brazil are migrating from rural to urban areas in search of work, which favors the transmission of malaria and leishmaniasis into the cities. However, it was observed that malaria also increased after the floods associated with this phenomenon (UNEP & ACTO, 2009).

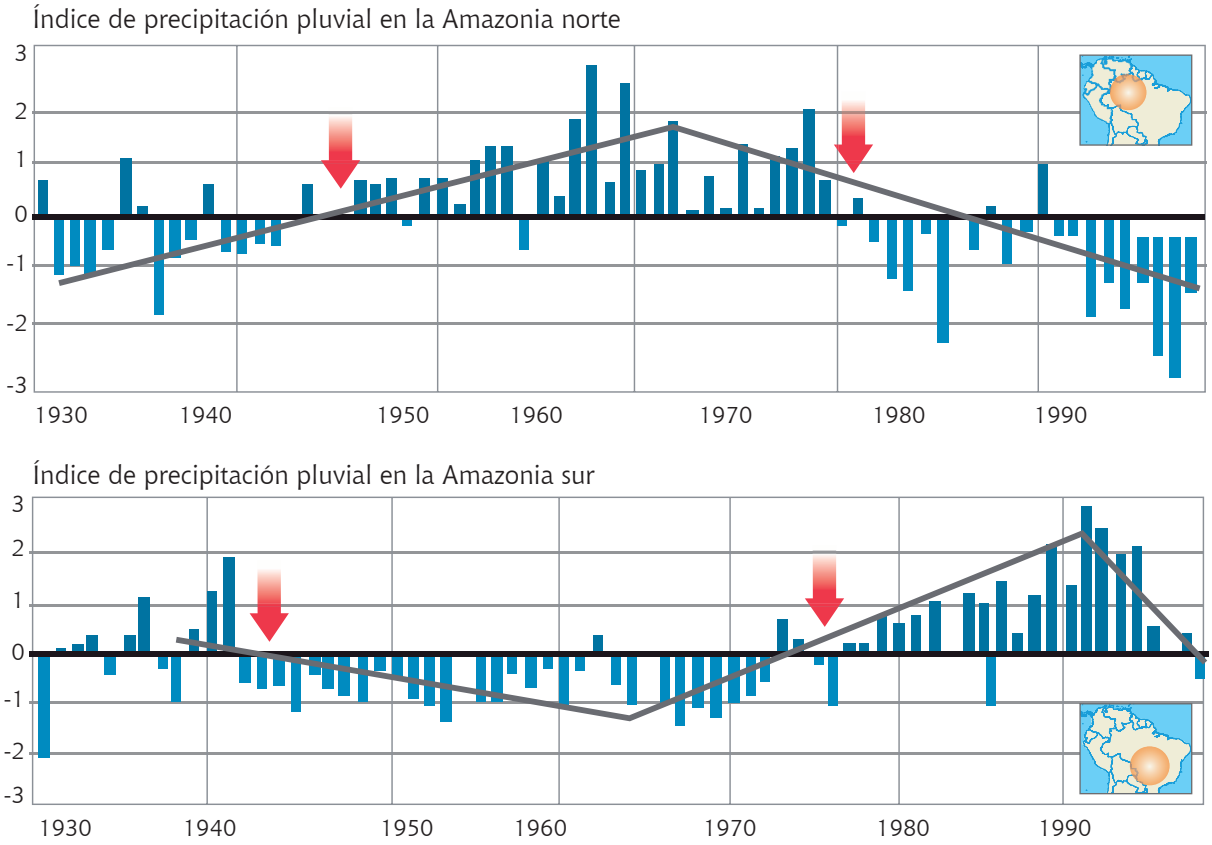
The rainfall trends in the Amazon are not entirely clear. According to Marengo *et al*. (2000), variations of rainfall in several decades have shown opposite trends in the north and south of the Amazon basin (Graph 2). In this sense, the 1950-1976 period was a rainy one in the northern Amazon, and since 1977 the region has been rather dry, which suggests climatic variability, but no clear pattern of rainfall (UNEP & ACTO, 2009). At this point, it is important to note that in almost 40% of the Amazon forests, the reaction caused by a small reduction in rainfall could be dramatic, meaning that tropical vegetation, hydrology and the climate system in South America could be altered very rapidly in search of another state of equilibrium, not necessarily producing gradual changes between the current situation and the future (Rowell & Moore, 2000). Similarly, if the reduction in rainfall during the dry season actually occurs, the impacts on the water regime of the Amazon will be exacerbated (Nijssen *et al*., 2001).

The Amazon biome plays a key role in the climate ecosystem. It helps drive the atmospheric circulation in the tropics by absorbing energy and recycling about half of the rain that falls on it. In addition, it is estimated that the region contains almost 10% of the global carbon reserves stored in land ecosystems (Melillo et al., 1993). The moisture which the Biome injects into the atmosphere also plays a critical role in patterns of rainfall in the region. Any disruption in the volumes of moisture coming from the Amazon basin can trigger a process of desertification over vast areas of Latin America and North America (Avissar and Werth, 2005).

Notwithstanding, responsibility for the outbreak of climate change and its effects is at the forefront of today's industrialized countries, the dynamics of atmospheric circulation and oceanic circuits mainly determine the fact that these have an impact on the entire planet. In this scenario, some countries and regions should emphasize on the mitigation of climate change, an issue which was precisely the focus of the commitments made in the Kyoto Protocol, while other countries which mainly the ones suffering the consequences shall have to concentrate on adaptation actions. In the case of the **Amazon**, which possesses the world's largest continuous rainforest heritage, the perception is that preservation is an essential tool in the fight against climate change.

However, in recent years, with the provision of satellite techniques for monitoring the forest cover, it has been shown that deforestation in the region taking gigantic steps (Table 10). In total, about four million hectares per year of the Amazon forest are lost as a result of logging and subsequent burning, changes in land use such as, mainly, speculative agriculture and extensive ranching. In Guiana, over the 2007 - 2008 period, nearly 54,210 ha. were deforested; i.e. the annual deforestation rate reached 0.29% (Guiana Forestry Commission, Quick Assessment Report, 2009). In Brazil during the years 2000 to 2009, 176,536 km^2 have been logged (PRODES, 2009)[25].

25. PRODES: Monitoring Program of Amazon Forest by Brazilian Satellite). http://www.obt.inpe.br/prodes/prodes_1988_2009.htm



Graph 2. Rainfall in the Amazon region.

Source: UNEP & ACTO, 2009.

Table 10. Deforested areas and deforestation rates in some of the Amazon region countries

Country	Cumulative deforested area (km²) 2000-2005	% Of total area deforested by 2005	Annual deforestation (Km² / year) 2000-2005
Brazil	130.224	79,50%	21.704
Peru	69.713	8,20%	123
Bolivia	45.735	5,30%	2.247
Colombia	29.302	3,4%,	942
Venezuela	12.776	1,50%	553
Ecuador	8.540	1,00%	388
Guiana	7.390[26]	0,90%	210
French Guiana	-	-	-
Suriname	2.086	0,20%	242
TOTAL	**857.666**	**100%**	**27.218**

Source: UNEP & ACTO, 2009

26. The total forest surface of Guiana, for 2007, was 18,600,000 ha.

The pressure on the Amazon forest is found in greater proportion in the east and southeast of the Amazon (Brazil) in the so-called arc of deforestation, and in the northwest of the head of the basin between Colombia and Ecuador (Figure 5).

The release of greenhouse gases - GHG[27], following the burning of the Amazon rainforest, feed the global climate change. A World Bank report says that about half the emissions in Latin America are due to changes in land use and in some countries such as Bolivia, Brazil[28], Ecuador, Guatemala and Peru. It is more than 60%, which means that 12% of global emissions come from this region (De la Torre *et al.,* 2009). Given this, the need to commit with urgent actions in order to mitigate climate change in the region is evident (Rocha, 2008).

Projections to the year 2030 submitted by Nepstad (2007), although pessimistic, allow the vision of a highly probable minimum conservation (lower cost) characterized by large blocks best preserved in relatively isolated enclaves surrounded or strips of deforestation and transformation (Figure 3).

The role of protected areas regarding climate change

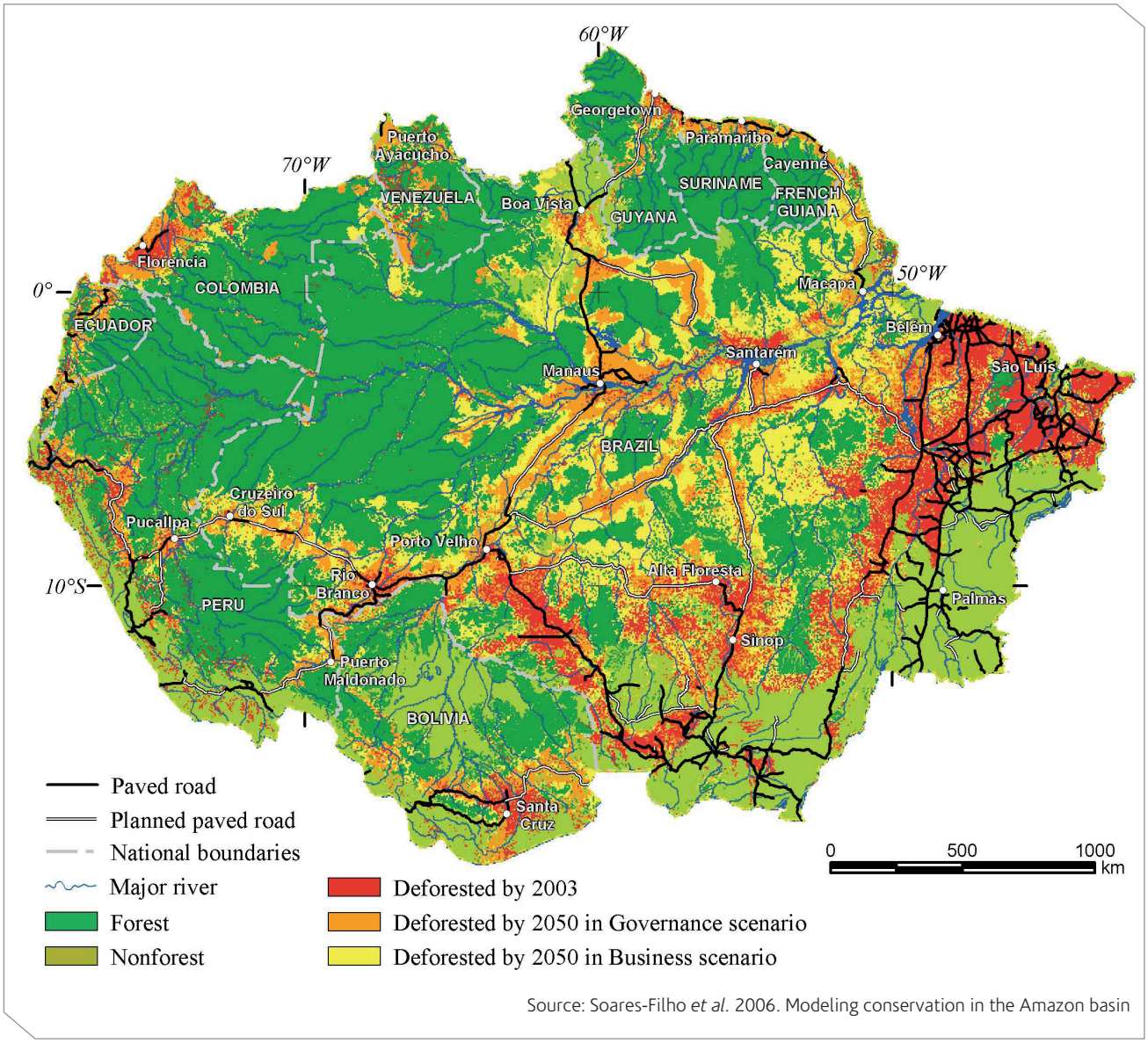
The creation of most of the existing protected areas and the definition of conservation goals related to habitat and species representation, assume a relatively constant climate behavior (Hannah *et al.,* 2007).However, as the climate has undergone changes, it has become necessary to reconsider the plans and assumptions about protected areas (McCarty, 2001).

It is expected that climate change will affect established protected areas in many ways: species are predicted to migrate into areas of temperature and precipitation that will be most favorable and most likely other competitors or even invasive species better adapted to new conditions climate will be installed in the places abandoned by species who used to live thereat. These shifts may, in some protected areas, determine habitats and identify mosaics of different species which it was originally was intended to protect.

However, in light of this phenomenon, protected areas will take on even greater importance as a strategy for biodiversity conservation, to i) provide refuge for species migration corridors, ii) to protect human populations from sudden climatic events, reducing for example their vulnerability to floods, droughts and other disasters caused by climate, and iii) in an indirect way, upon reducing the costs of negative impacts related to climate, protected areas allow economies to adapt to climate change (Sayer, 2005).

So as to ensure the survival of priority species of plants and animals which have been selected for preservation it shall be necessary to obtain new information on the sensitivity of the species to disruptions (e.g., roads, agriculture, human settlements), their sensitivity the edge effect, i.e. the relationship between perimeter and area (usually the higher the ratio, the greater the sensitivity of species to disturbances from outside the perimeter), their

27. The greenhouse gases occurring naturally in the atmosphere are water vapor, carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O). Besides these, the man produces and releases into the atmosphere other greenhouse gases such as chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexafluoride (SF_6).
28. In Brazil, emissions account for 75% of its total emissions of carbon dioxide (Secretariat of the Convention on Biological Diversity, 2009).



Source: Soares-Filho *et al.* 2006. Modeling conservation in the Amazon basin

Figure 3. Main areas and enclaves of deforestation that outline large blocks where conservation is most likely (lower cost).

expertise and availability of food and food quality of the habitat they require (for example, primary or secondary forest), their movements, especially in stressful situations, their migratory habits and their schedules and relationship to local human communities and other species (Mansourian, 2006) . This information may overlap with predicted climate scenarios, and this shall allow the development of actions to protect biodiversity.

On the other hand, an important point to consider is that protected areas can provide other ecosystem services such as potable water storage, carbon and soil stabilization, and these areas may also contain sacred sites for different communities, especially indigenous communities, and signify valuable gene reservoirs, important in the field of medicine, agriculture and forestry. In light of all of the above, protected areas take on a more strategic char-

acteristic, in the search to strengthen the capacity of the local population to adapt to climate change (Simms, 2006).

In addition, protected areas contribute to physical protection against major disasters, whose number, according to forecasts, will increase evenly with climate change (Scheuren *et al.,* 2007). Although the dimensions of disasters usually depend on a combination of factors (e.g. regulations on building or land use), in many cases the effects could be lower if the ecosystem is being maintained and the forest is subject to protective measures.

On the other hand, the loss of protected areas can result in substantial economic costs. It is estimated that deforestation of the major forest block such as the Amazon forest may have an impact on global precipitation, which in turn have a negative impact on agriculture and hence the source of living of millions of people (Mansourian et al, 2008). Therefore, protected areas contribute not only to the protection of biodiversity, but also indirectly to global food security and the regional economy.

According to Paredes (2007), based on the fact that protected areas are a cost-effective and socially desirable way to address the climate change issue, there is a need to articulate the issue to the management planning of protected areas, addressing actions in four moments (PREDECAN & GTZ. 2005): i) prevention, ii) mitigation, iii) care and rehabilitation, reconstruction and iv) adaptation, summoning on different social and institutional agents (local communities, local authorities, environmental authorities , research institutions and specialized personnel in rescue, humanitarian and technical subject - specialized committees, water resources, fire) for working together starting from clearly defined powers and responsibilities.

Current proposals on climate change and the Amazon Biome

It is important to note that the Amazon biome and protected areas generate environmental services, having at present an estimate of its economic values (Table 11). These environmental services include the supply of water resources, which is critical to the effects of climate change, nutrient retention, protection from fire, prevention of erosion, pollination, regulation of diseases and carbon storage, option which creates potential for carbon markets in relation to the Clean Development and Avoided Deforestation Mechanism and the United Nations Collaborative Program on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries - REDD.

Table 11. Estimated amounts of some of the Amazon Biome ecosystem services

Ecosystem services	Economic Value
Erosion prevention	238 US$ / ha / year
Fire Protection	6 US$ / ha / year
Carbon storage: 1. Avoided damage due to emissions of CO2 avoided. 2. Value of total carbon stored in forests preserved (undisturbed)	70 - 100 US$ / ha / year 750 - 10000 US$ / ha / year
Maintenance of biodiversity	Unknown
Cultural aspects related to forest	Unknown
Protection against diseases	Unknown

Source: Adapted from: Verweij, P *et al.*, 2009.

As for the REDD, this is currently regarded as one of the instruments with the greatest potential to prevent the loss of forests, through a simple idea: the countries that are willing and able to reduce carbon emissions from deforestation must be compensated financially. At this point, Brazil is playing a key role. Overall, the proposal of the Government of Brazil is the establishment of a voluntary fund to which developed countries provide new funding to existing funds allocated to address the issue of deforestation and forest degradation.

All developing countries will be eligible for financial aid after having demonstrated, in a transparent and credible manner, that they have reduced emissions from deforestation. Incentives should be based on a comparison of historical rates of emissions from deforestation and Reference Emissions Rates (RER). Decrease in emissions will be object to credit and all increases will, in turn, be deemed as debts. The emission price per ton will be negotiable and subject to periodic revision. It is also proposed that the count shall be done nationally and incentives shall be distributed according to the emission reductions achieved by each country. The RER - Reference Emissions Rates is the average rate of deforestation in a previous period of 10 years since the establishment of the UNFCCC, the recount shall be done every 3 years based on average emissions from deforestation in the last 3 years, with the aim of verifying whether rates have fallen below the level indicated by the RER (Parker *et al.,* 2009).

Guiana has undertaken, under a REDD + scheme, a draft forestry service payments, especially for carbon storage. The project has been managed directly by the President, and has obtained a commitment with Norway worth $ 250 million through a memorandum of understanding. The governments of Norway and Guiana believe that this approach may provide the world with a practical and replicable example of how countries can contribute to reducing deforestation using a REED + scheme. The Government of Guiana, in support of this project, has developed the "Low-carbon Development Strategy", which establishes hoe REED + payments, will be used to steer the Guyanese economy towards a development path with low carbon emissions.

On the other hand, Colombia believes that each party should be able to choose their reference levels at local and national levels. In this sense, Colombia proposes a project management level through a methodology whereby the displaced emissions would be deducted from the loans for major projects. Colombia also proposes that the reference levels can be used as a means of extrapolation of past trends into the future and that emissions can be negotiated and fully fungible emission reduction credits can be contrasted with the reference levels mentioned (Parker *et al.* 2009).

Another important initiative for the biome is the Prince's Rainforest Project (PRP), promoted by the Prince of Wales. The PRP's main objective in the short term is that of achieving a significant reduction in tropical deforestation through annual payments for nations with rainforest to help them move in the alternative development path with low carbon emissions. This will be funded through public - private partnerships in developing countries, which include the issuance of Rainforest Bonds (Parker *et al.,* 2009).

The PRP proposes to establish an institutional framework to a) negotiate multiyear agreements for nations with rainfor-

est which are based on the cost of moving to a development path of low deforestation, b) obtain the necessary financing from public and private sources, c) verify the country's performance according to the objectives of deforestation, d) transfer money to countries with tropical forests based on the agreements and the results achieved and e) help coordinate and / or finance assistance to countries with tropical rainforest for development plans, monitoring systems, etc. As a whole, this framework is called the Tropical Forest Fund (Parker *et al.,* 2009).

As proposed by the PRP, developed countries would be free to decide how to finance their obligations. Likewise, the PRP is also developing a proposal for governments to generate a substantial portion of financing through the issuance of Rainforest Bonds in private capital markets (Parker *et al.,* 2009). Currently, the Amazon countries are evaluating the proposal made by the PRP.

Extensive livestock

"The livestock is listed as one of the most significant threats to the conservation of Amazonian ecosystems. It is claimed that, of the 930,000 km² of forest cleared in the Amazon Biome until 2000, 80% was replaced by grasslands. Deforestation caused by this activity is responsible for the release of 0.34 million tons of carbon into the atmosphere each year, i.e. 3.4% of current global emissions (WWF, 2008).

Brazil has the largest tract of land in pasture, followed by Peru and Bolivia (Table 12). By the year 2007 in the Brazilian

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Amazon there were almost six acres of pasture per hectare of agriculture.

The growth of this activity is largely due to its high profitability[29] and the Aftose – Free declaration in some states, which allowed the region to be incorporated into export chains (Martino, 2007). Grazing densities range from livestock production systems and between countries (0.1 animal / ha. In Peru and 1.3 in Bolivia). However, the livestock referred to as extensive (less than 1 unit / ha) is dominant in the Amazon (WWF, 2008).

It is hoped that, in the future, livestock will continue its progress in the Brazilian Amazon, especially. This is due to projections in increasing meat consumption worldwide, a potential major gateway to international markets due to improved sanitation, and the «removal» of livestock (to the north of Brazil) for the advancement of higher performance intensive crops (e.g. soybeans) (Martino, 2007).

29. The return of investment in large-scale establishments with high productivity (1.4 animals per hectare according to IBGE) is 4.6 percent, a level – thirty - five percent - higher than Central southern Brazil. This high return is explained by the low price of land, the potential of increasing the value of it, and pasture productivity, but also by easy access to public lands, soft loans, and logging at rates greater than those permitted by legislation (twenty percent).

Table 12. Amazon basin extension in crops and pastures

Amazon Country	Area in crops (km²)	Area in pasture (km²)	Livestock density (AU's/ha)
Bolivia	17.418	39.215	1,3
Brazil	134.396	669.521	0,7
Colombia	3.116	21.865*	-
Ecuador	7.134	8.576	0,6
Peru	28.232	71.481	0,1
Venezuela	5.528	5.610	-
Suriname	664	811	1,7
Guiana	4.954	434	0,4

*Data for 2001 in the Colombian Amazon
Source: WWF 2008. Taken from Nepstad *et al.*, 2008 and 2007 Sinchi.

Mechanized Agriculture

Another important source of pressure for the Amazon ecosystems is exerted by subsistence agriculture (especially in areas of the Amazon piedmont of Colombia), as well as technified agriculture (central and southern Brazil). As with livestock, in terms of land devoted to agricultural production, Brazil ranks first (67% of the crop surface), followed by Peru (14%) and Bolivia (9%). Brazil is the world's leading exporter of orange juice, ethanol, sugar, coffee and soybeans.

High - tech agriculture has been growing in the region, which responds to trends in globalization of the economy and increased demand for biofuels, soy, sugar cane and oil palm in particular. In the Brazilian Amazon, soy production increased from 2 to 6 million hectares from 1990 to 2006 (WWF, 2008).

While the vast majority of soybean crops still occurs outside of the Amazon, its influence is growing, not only by demand from countries like China, but also due to domestic demand. In Brazil, a large percentage of the transport fleet moves on vegetal fuel. In order to produce biofuels it is necessary to increase the area of production of crops such as soy, palm or sugar cane (Martino, 2007).

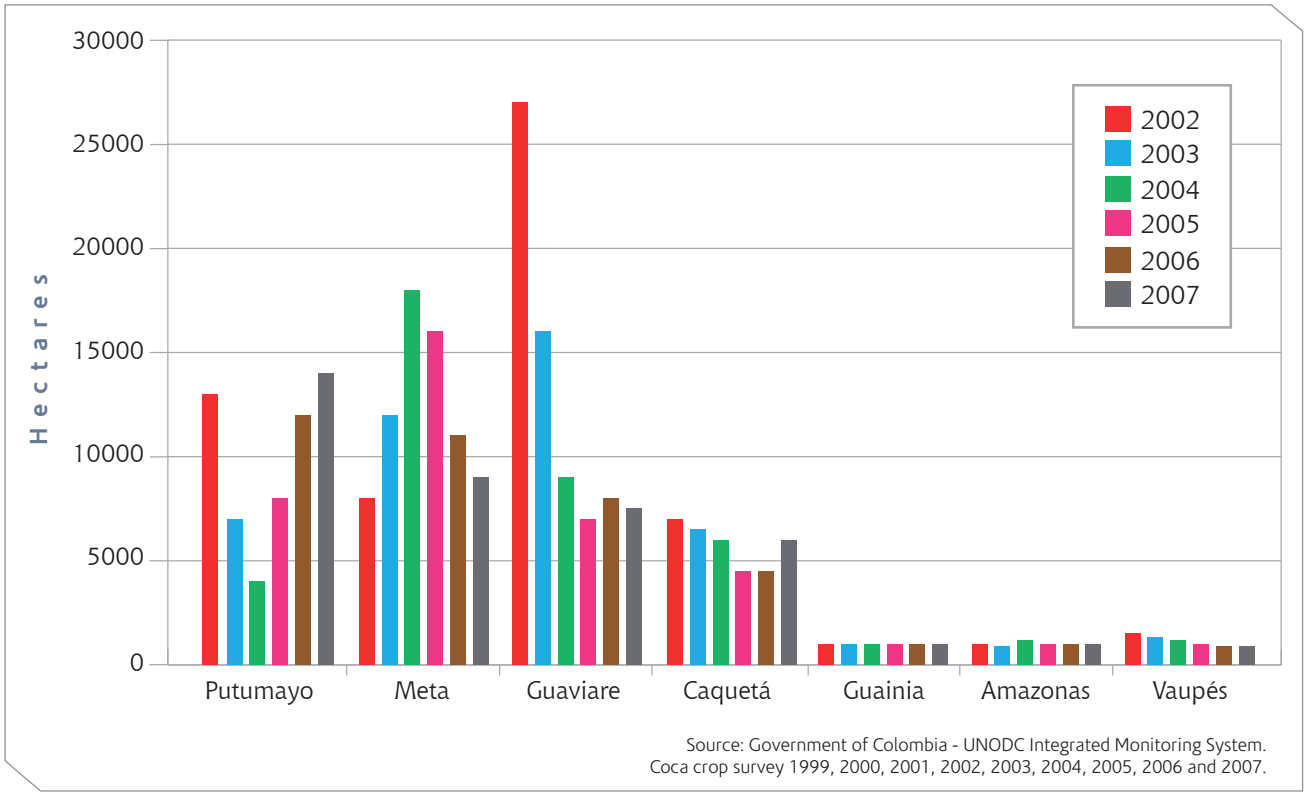
Illicit crops

Coca cultivation and the fight against them are a factor of deforestation in the upper reaches of the Amazon, on the eastern slopes of the Andes in Colombia, Peru and Bolivia.

Studies have estimated that coca crops are responsible for 24% of deforestation in the Peruvian Amazon. In Colombia, this crop has become one of the main causes of deforestation due to external demand for cocaine and contraction of areas in other countries (particularly Peru).

According to information from the UNODC Integrated Monitoring System, coca crops decreased in the Colombian Amazon during the period 2002 to 2007, from a total of 61,758 ha to 42,287 ha. (Graph 3). There has been a shifting phenomenon in crops. Guaviare, which had the largest area in 2002 (27.381 ha), significantly reduced its size to about 9,300 ha in 2007. Crops increased in Putumayo and Meta going from 13,725 ha to 14,813 ha, and from 9,222 ha to 110,386 ha respectively.

Protected areas and indigenous territories have not been alien to this phenomenon. By the year 2002 there were, in the Colombian Amazon, approximately 4300 hectares of national parks, associated with illicit crops (Table 13).



Source: Government of Colombia - UNODC Integrated Monitoring System.
Coca crop survey 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006 and 2007.

Graph 3. Coca cultivations crops in the departments provinces of the Colombian Amazon. 2002– 2007

Table 13. Areas of illicit cultivations crops in natural parks of the Colombian Amazon (2000 - 2006)

National Natural Parks	Illicit crop area in hectares (2000 - 2006)						
	2000	2001	2002	2003	2004	2005	2006
Wasi Altofragua-Indi			16,00	8,00	14,00	25,00	1,00
Chiribiquete	79,01	5,00	2,00				
Cordillera de Los Picachos	64,89	243,00	34,00	13,00	15,00	7,00	6,00
La Paya	1.267,30	640,00	600,00	310,00	230,00	728,00	527,00
Nukak-Maku	743,24	.342,00	1.464,00	1.469,00	1.044,00	930,00	779,00
Puinawai	84,16	182,00	108,00	33,00	39,00	60,00	41,00
Sierra de La Macarena	1.156,17	1.618,00	1.450,00	1.152,00	2.707,00	3.354,00	1.689,00
Tinigua	926,15	1.201,00	413,00	340,00	387,00	155,00	122,00
Yariguies	sin cultivos	sin cultivos	sin cultivos	sin cultivos	sin cultivos	2,00	4,00
TOTAL	**4.320,91**	**5.231,00**	**4.087,00**	**3.325,00**	**4.536,00**	**5.261,00**	**3.169,00**

Source: SIMCI - ONU, 2000, 2001, 2002,2003, 2004, 2005 y 2006

Alteration and degradation of environmental flows

As for the Amazon Basin's hydric potential, whatever happens to water may, as it can be seen, have consequences on the different components of biodiversity (ecosystem flow interruption) as well as in populations which depend directly and indirectly from these goods and services.

A series of activities is currently under development in the Amazon countries, as a product of the demand for modernization and expansion of their economies: i) development of water infrastructure on a large scale, ii) mining, iii) exploration and exploitation of hydrocarbons and, to a lesser degree, iv) disposal of wastewater. Its effects vary in magnitude (area), intensity and urgency; however, as a whole, they can drastically alter the whole water system in quantity, quality and availability (WWF, 2008).

Hydro – electric infrastructure development

The Amazon basin is considered the river system with the largest hydropower potential in the world. Brazil is the country with the largest number of large reservoirs, wherein Tucuruí and Balbina are noteworthy. Twelve hydraulic dam projects (in the headwaters of the Andes) are currently under way in Ecuador. Many of these projects are related to mining - energy development (Killeen, 2007). In the Tucuruí dam[30], some research projects were developed on the environmental impact of this work and the risk of disappearance of fish stocks, which is most noticeable near the falls of the river, was evidenced (UNEP & ACTO, 2009).

To date, no South American country has built a dam for a large Amazon river. This may change, if the Madeira River hydroelectric complex building project comes true, which would build a dam for the second largest river in the basin. Due to its characteristics and Andean origin, the Madeira River carries half of the sediments in the basin and drains one of the regions of greatest physical and biological diversity of the world, which is shared by three countries: Bolivia, Brazil and Peru. Environmental impact studies of two dams of the complex located downstream complex in Brazilian territory, identified impacts of very high magnitude that would have effects on fish, wildlife, population, sediment, and the spread of tropical diseases (UNEP & ACTO, 2009).

Mining

Mining is an important activity in the region. It varies depending on the mineral, the location of the exploitation sites, the agents involved and the scale of operation. There are two main categories of mining in the Amazon: large industrial complexes located in the Andean and eastern Amazonia, and gold mining by small producers. In the eastern Amazon there are significant reserves of industrial minerals such as bauxite, iron ore, manganese, zinc, tin, copper, nickel, kaolin and other minerals as well as lesser known ones, supplies for modern technology, such as zirconium, tantalum, titanium, beryllium and niobium. These reserves also include the largest iron ore mine in the world in Pará - Brazil, as well as a huge complex of bauxite mines and aluminum smelters in Brazil, Venezuela and the Guianas (WWF, 2008).

30. Currently the largest dam in the Amazon.

The Andean countries have a long tradition of gold, silver, tin and copper mining. Bolivia (highlands in the region of Beni) and Peru (upper basin of Madre de Dios) have now the largest gold production at small scale.

Mining especially, small – scale mining, is characterized by impacts such as erosion, runoff and pollution (especially mercury) of aquatic and terrestrial ecosystems. This has occurred especially in the Guiana Shield, in the Andean mountains of Bolivia and Peru, and in the Colombian piedmont. In the case of fisheries, mining activity particularly affects large catfish that move between the estuary of the Amazon and the foothills of the Andes (UNEP & ACTO, 2009).

In general terms, as opposed to livestock and agriculture, mining complexes themselves do not tend to generate regional - scale changes. However, the impact of mining is indirect and generated by the complementary infrastructure for its operation: hydroelectric complexes, railway infrastructure, port infrastructure, etc.

Exploration and exploitation of hydrocarbons

Major oil and gas fields in the Amazon can be found near the Andes in Colombia, Ecuador, Peru and Bolivia. It is claimed that the western Amazon has a large potential of reserves of unexplored oil. The increase in recent years of concessions for exploration or exploitation has become widespread in the countries of the Biome. In 2002 there were 30 approved blocks for exploration and in 2006 this figure increased to 151exploration blocks. Overall, concessions until 2006 were granted for circa fifty – two thousand six hundred million hectares, of which 85% was in the exploration phase and 15% in production (Table 14) (WWF, 2008). Peru is the country with the largest area under threat from oil exploration and exploitation. 70% of the Peruvian Amazon has been granted oil concessions; Brazil and Ecuador have given 13% and 11% respectively of their territories (WWF, 2008).

By 2006, 12% of oil production in all countries of the region came from the Amazon. However, if Brazil and Venezuela are not considered (both have substantial reserves outside of the Amazon), the contribution of oil in the Amazon region, in other countries, is 50%. The above means that this territorial space is increasingly important as a provider of traditional energy sources and thus as a source of revenue for national governments (WWF, 2008). On the other hand, high oil and gas prices, justify the revival of work in some areas of oil exploration which were discarded in the past due to reasons of inaccessibility.

Natural gas reserves in the Amazon are a relatively recent discovery. The Camisea gas field in Peru is one of the largest energy projects in South America. There are also gas reserves in Bolivia which can provide the countries in the region with energy, which in the future means that the Amazon shall have to face the execution of infrastructure projects for trade in this product (UNEP & ACTO, 2009).

The most serious and direct environmental impacts of the exploitation of hydrocarbons are oil or gas spills. Notwithstanding, the indirect impacts are significant and can have negative effect at the local, landscape and / or national level: migration and population displacement, increased exploitation of local resources, adequacy of infrastructure (roads, waterways, utilities, housing, etc.)

Furthermore, many of the concessions have been approved in indigenous terri-

Table 14. Concessions for hydrocarbon exploration and exploitation approved for the Amazon region in 2006.

Country	Concessions	Hectares	% According to the concession
Bolivia	Exploration	2.978.495	6
	Operations	0	0
	Total	**2.978.495**	6
Brazil	Exploration	5.700.000	11
	Operations	1.000.000	2
	Total	**6.700.000**	13
Colombia	Exploration	781.751	1
	Operations	174.426	0
	Total	**956.177**	2
Ecuador	Exploration	n.d.	-
	Operations	5.000.000	10
	Total	**5.000.000**	10
Peru	Exploration	35.214.244	67
	Operations	1.723.710	3
	Total	**36.937.954**	70
Venezuela	Exploration	0	0
	Operations	0	0
	Total	**0**	0
Cuenca Amazónica	Exploration	44.674.490	85
	Operations	7.898.136	15
	Total	**52.572.626**	100

Source: WWF, 2008. Taken from Campodónico, 2008

tories and protected areas[31]. In Peru, for example, oil operations are in some NPA's such as the Pacaya-Samiria Machiguenga Communal Reserve and the Pucacuro Reserve Zone.

Waste Disposal

Water sources in the region are used especially for domestic, agricultural, livestock and industrial applications. These generate certain impacts that vary according to activity and given technological management. According to reports, the coverage provision of public services (water, sewage, sanitation) for each of the countries sharing the Amazon region, rarely exceeds 60%. In rural areas, this rate drops substantially. In this regard, one of the threats facing the waters that are used in proximity to urban centers is related to basic sanitation, since about 70% of solid waste disposal is without any treatment and into the open air. It is estimated that the Amazonian rivers receive 1,700,000 tons of waste and 600 l/s of leachate to the environment (Table 15).

Agricultural and industrial activities also generate impacts on ecosystems, which are related to the use of fertilizers, plaguicides, pesticides, weed controllers and products from mechanization processes. As for industrial processes, gold mining

31. Of the 151 concessions granted in 2006, 26 concessions are in overlap with protected areas.

Table 15. Waste and leachates reaching some Amazon region rivers

Country	Solid waste* (Tn)	Leachates (Tn)	Solid waste going into rivers
Bolivia	94.275	5	18.855
Brazil	5.438.584	388	1.087.716
Colombia	254.802	24	50.960
Ecuador	47.654	6	9.530
Guiana	-	-	-
French Guiana	-	-	-
Peru	2.445.906	155	489.181
Suriname	90.000	7	18.000
Venezuela	37.000	3	7.400
Total Amazon	8.408.224	589	**1.681.644**

Source: UNEP & ACTO, 2009.
*The estimated solid waste is made from multiplying the production rate per capita in the basin (0.2 - 0.4 t / year) by the population data by country in the region. Based on data from (Nadalutti 2002, Brazil: IBGE 2006; GEO Brazil - Water Resources 2007).

is perhaps the most devastating one. Gold is mainly found in an alluvial manner and must be precipitated from the sediments through the use of mercury[32]. Similarly, miners use high pressure water streams to dig the river banks; these practices cause an increase in suspended solids and therefore the abnormal functioning of natural habitats for aquatic species.

Resource extraction

Non – controlled logging, the extraction of other forest products, wildlife hunting and harvesting of aquatic fauna are other threats to wildlife in the region.

Overexploitation of natural resources in the Amazon for a living and for market supply has been a concern since the first Europeans arrived to the Amazon. It is alleged that the illegal wildlife trafficking is the third largest illicit activity on the planet, and the Amazon Region is not unaffected by this phenomenon. For example, according to estimates, about 38 million wild animals are subject to smuggling across Brazilian borders. Ecuador is the country with the most reports of biological groups with some degree of threat, followed by Brazil, Colombia and Peru, respectively (Table 16).

According to WWF (2008), removal of species and its subsequent decrease, are largely driven by i) markets (including local, regional and international demand), ii) inadequate legal frameworks which fail to regulate or to enforce standards, iii) lack of alternative sources of income, iv) opportunistic use of the land (land tenure and lack of planning and zoning) v) insufficient scientific knowledge and vi) low perceived value of goods within the ecosystem.

32. It is estimated that one to three grams of mercury are used in order to obtain a gram of gold, as well as cyanide and detergents.

Table 16. Number of threatened species, by group of organisms, by country.

Country	Mammals	Birds	Reptiles	Amphibians	Fish	Mollusks	Other invertebrates	Plants	Total
Bolivia	24	32	3	23	0	0	1	71	**154**
Brazil	69	160	20	16	154	40	163	108**	**622**
Colombia	38	88	16	217	28	0	2	225	**614**
Ecuador	34	76	January 2005	165	14	48	0	1832	**2180**
Guiana	January 2005	3	6	9	-18	0	1	23	**71**
French Guiana	6	0	6	3	24	0	0	16	**55**
Peru	46	98	8	86	8	0	2	276	**524**
Suriname	January 2005	0	6	2	19	0	0	27	**65**
Venezuela	26	25	13	71	26	0	3	69	**233**

Source: : UNEP & ACTO, 2009, IUCN (for French Guiana)

Chapter 2

The Amazon Biome: progress in the execution of the Program of Work on Protected Areas (PWPA)

Protected areas are by far the conservation strategy of the goods and services of the biological diversity components as well as of ecological and socio cultural processes. Conservation areas have increased considerably worldwide in the past years. In spite of this, the loss of biodiversity also continues and it has accelerated in many geographical spaces. It has been implied that the systems and figures of protected areas are not efficient, in most cases due to the following reasons: i) they do not meet conservation objectives, ii) the systems are incomplete, iii) participation of ethnic groups and local communities in the creation and management of these geographical spaces is insufficient and iv) management and funding is poor.

As mention before, to attend to aforementioned arguments and gaps, the Program of Work on Protected Areas was adopted at the seventh meeting of the Conference of the Parties to the Convention on Biological Diversity. This program seeks to support the creation and maintenance (for land areas by 2010 and for marine areas by 2012) of complete national and regional systems,

efficiently managed and ecologically representative of protected areas that collectively and, among other means through a global network, contribute to achieving the three objectives of the Convention and to the 2010 goal which is to reduce significantly the current pace of biological diversity loss (Secretariat of the convention on biological diversity 2004).

The Program of Work on Protected Areas is made up by four the elements as listed below; they are linked to one another and they are executed by objectives, goals and activities:

- **Element 1. Directing actions to plan, select, create, strengthen and manage the systems and sites of protected areas.**
  It encompasses the creation, strengthening and management of systems and sites of protected areas, integration of protected areas into broader land and sea areas and into the different planning sectors, and strengthening of cooperation between adjoining protected areas across national boundaries, improving the planning and administration of protected areas based on the site; preventing and mitigating the negative impact of serious threats to protected areas.
- **Element 2. Governance, participation, equity and participation in benefits**
  This element is related with the legal-institutional frameworks, structures, knowledge systems and cultural values that determine the way in which decisions are taken, the participation mechanisms of the different players and the ways responsibility and the power of the protected areas are exercised.
- **Element 3. Favorable activities**
  It implies providing a favorable policy, institutional and socio economic environment for the protected areas, creating capacity for planning, creation and administration, applying adequate technologies, guaranteeing financial sustainability and strengthening communication, education and public awareness.
- **Element 4. Standards, assessment and supervision**
  It implies creating and adopting minimum standards and best practices, assessing and improving the efficiency of the administration of protected areas, appraising and supervising the situation and trends of the protected areas, and ensuring that the scientific knowledge contribute to the creation and to the efficacy of the protected areas.

The result expected with the implementation of the Program of Work on Protected Areas, is the creation and maintenance of a national and regional system of protected areas that is representative ecologically speaking and that is managed efficiently. This system must be integrated into a global network of protected areas, where human activities are managed in such a way that the structure and function of the entire ecosystem range is preserved, aimed at continuing with the provision of benefits for present and future generations, and in order to achieve an important reduction of the pace at which biological diversity is being lost (Secretariat of the Convention on Biological Diversity 2004).

The following sections, present the main advances in the implementation of the PWPA in the Amazon Biome region. It is based on the results obtained from the execution of the work plan for building an ecosystem based vision of biodiversity of said geographical area, which was agreed by the Directors of the systems of protect-

ed areas of the Amazon region states. The work plan considers the experiences of the systems of protected areas of the Amazon region states to structure jointly a general strategy that integrates the results and tools of each country and this way they would be to able to establish joint mechanisms that allow for the effective achievement of all the objectives pursuant to the conservation of regional biodiversity.

Element 1.

Directing actions to plan, select, create, strengthen and manage the systems and sites of protected areas.

CONSOLIDATION OF SYSTEMS AND NATIONAL AND REGIONAL SITES OF PROTECTED AREAS

Current Protected Systems and Areas

All Amazon region countries have national and regional systems of protected areas along with other figures or categories of conservation and sustainable use of natural resources (Figure 4). The creation in the last decades of an important number of protected areas, especially in the land areas is remarkable.

At present, the protected areas cover around 324.106.991,70 hectares[33], that is to say that nearly 47% of the area covered by the Amazon Biome is found under some protection figure (Table 17), this figure is indicative given that the region has other alternative ways of protection of biodiversity executed by the private sector, such as the rights of way, the ecologic reserves, the private reserves of civil society, concessions for conservation, concessions for ecotourism, among others. These areas are hardly quantifiable given that they are not officially recorded. However, a recent study of the Sociedad Peruana de Derecho Ambiental (Peruvian Society for Environmental Law) (2009), alludes that there are, in the region, nearly 2.618.153 hectares under some form of a private conservation scheme.

33. This includes, indigenous territories and forest land, although these categories are not recognized as legal figures of conservation in most of the Amazonian countries. However, indigenous territories constitute a big opportunity to supplement the national systems of protected areas, and in regards to forest land, management geared at sustainable use represents an additional opportunity to maintain conditions relatively favorable to the conservation in natural ecosystems that are being managed.

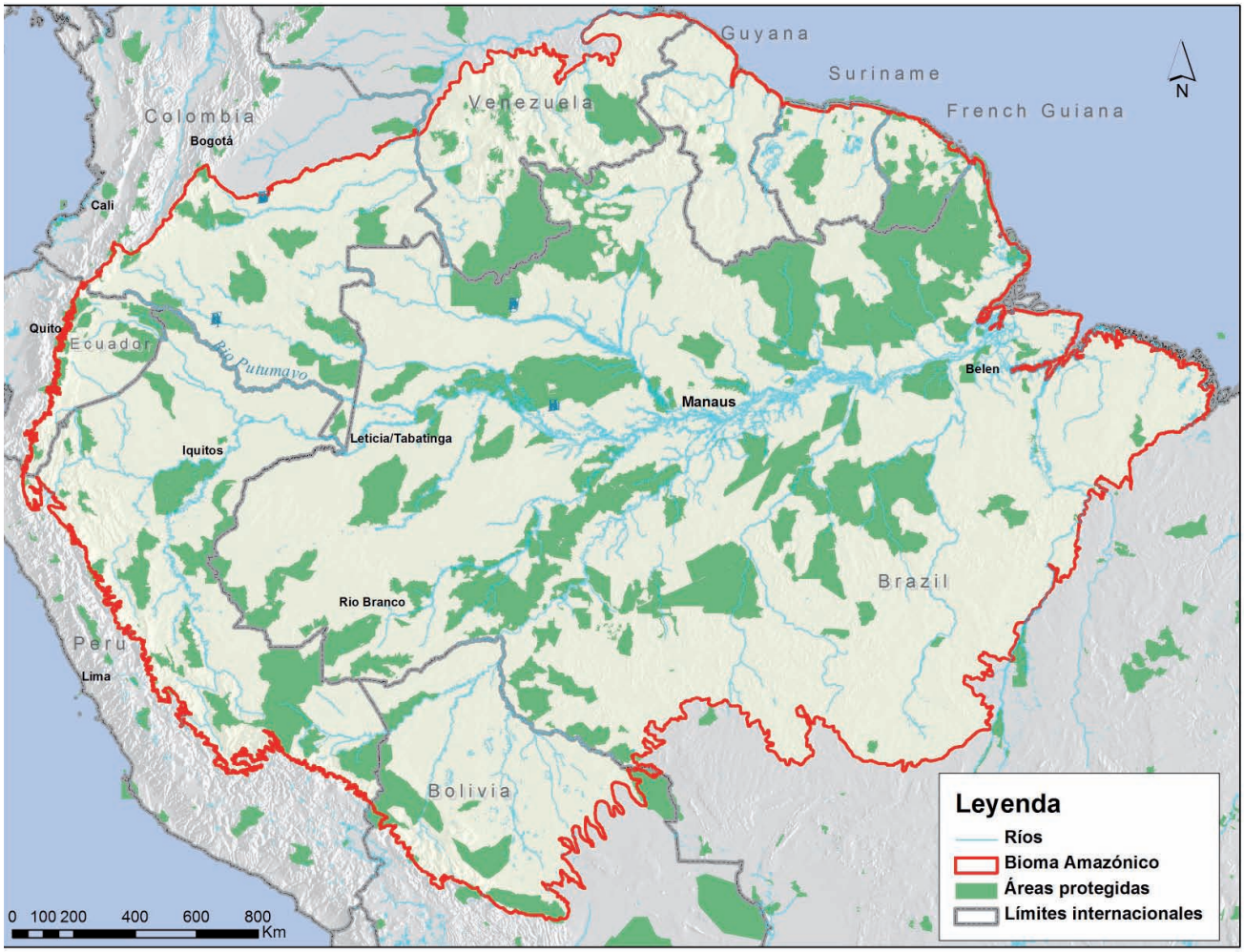


Figure 4. Current protected areas in the countries of the Amazon Biome

Source: Direcciones Parques Nacionales países amazónicos. Elaboró WWF Colombia.

Table 17. Categories of protected areas and other conservation figures in the Amazon region

Country	Category	UICN Categoría	Number	Hectares
Bolivia	Indigenous Territories		23	10528814,23
	Mobilization area		5	127309,472
	Natural Area of Comprehensive Management	VI	2	1145551,029
	Municipal Protected Area		2	587439
	Natural Monument		1	1144,743
	Provincial Park	II?	2	1555401,13
	National Park	II	4	5282429,083
	Regional Park		2	270629,261
	Wildlife Refuge		4	206,603,87
	Biological Reserve		1	10159,42
	Wildlife Refuge	VI	2	493832,09
	Forest Reserve		2	1298498,71
	Amazonian Wildlife National Reserve	IV	1	731532,96
	Inmobilizatioon Natural Reserve		1	727157,78
	TOTAL			22.759.898,91
Brazil	Ecologic Station	Ia	13	9851200
	Biological Reserve	Ia	11	4847700
	State Park (Parque estadual)	II	15	4799400
	National Park	II	19	20148900
	Environmental protection area	V	20	10674100
	Area of relevant ecological interest	IV	3	18900
	State Forest (Floresta estadual)	VI	10	9367900
	National Forest	VI	32	18921300
	Extractive reserve	VI	45	12262400
	Reserve of sustainable development	VI	14	9521800
	Particular reserve of natural heritage	IV	48	39600
	Indigenous Territories		464	109193556,72
	TOTAL			**209.646756,72**
Colombia	Natural national park	II	8	4.791.593,00
	Natural national reserve	Ia	2	1.947.500,00
	Flora and medicinal plants sanctuary	II	1	10.204,26
	Indigenous reserve		185	26.196.977,8
	Forest reserve		1	15.636.280,10
	TOTAL			**48.582.555,16**
Ecuador	Biological Reserve	I	2	13.113,29
	Ecological reserve	I	3	619.845,09
	National Park	II	5	2.162.873,17
	Wildlife refuge	IV	1	3.688,48
	Fauna production reserve	VI	1	624.880,78
	TOTAL			**3.424.400,81**

Country	Category	UICN Categoría	Number	Hectares
French Guiana	Protection of the Biotope	IV	4	25.700
	"Adhesion" National Park	VI	1	1.400.000
	"comprehensive type" National natural reserve	I	3	189.850
	"type management and ecotourism" National Natural Reserve	IV	3	111.230
	Regional natural park[34]	VI	1	264.000
	Areas in serious forest regime protection	II		325.475
	Areas in sustainable use forest regime	VI		1.674.525
	Registered Sites	V	14	52.900
	Coastline conservatory sites	V	14	14.836
	Regional Natural reserve	IV	1	2.475
	Guided biological reserve	I	1	110.700
	TOTAL			**4.060.991**
Guiana	National Park[35]	II and VI	2	496140.04
	Protection forest	IV		
	Indigenous Territories		102	3497631,477
	TOTAL			**3.993,772**
Peru	National Park	II	10	7347259, 44
	National sanctuary	III	5	288313,33
	Historical sanctuary	III	1	13180,92
	Protection forest	VI	4	351120,75
	Reserved area	Category temporary	6	3145421,54
	Community Reserve	VI	8	1776418,79
	National Reserve		4	2929148,83
	Wildlife refuge	IV	1	982,49
	Regional conservation areas		2	569950,25
	Coto de caza	VI	1	47695,28
	TOTAL			**16.469.491,6**
Suriname	National Park	II	1	16574.61
	Natural national reserve	IV	15	2355726.36
	Forest Reserve	VI	2	11758.51
	Management area	VI	1	234273.52
	Management and use area	VI	3	425161.66
	TOTAL			**3.043.494,66**
Venezuela	Natural Monument	III	19	2204358.44
	National Park	II	6	9921272.86
	TOTAL			**12.125.631,3**
	GRAN TOTAL			**324.106.991,70**

Sources: Direction Régionale de l'Environment (DIREN), 2010; SERNANP (updated on February 3, 2010); SICNA/IBC Perú (2010); National Parks of Colombia (2010), workshops records : Building a Regional Conservation Vision for the Amazon (Aug 28 to Aug 30, 2008) and Regional Conservation Opportunities in the Amazon Biome (May 27 and 28, 2009). Catastro Nacional de Unidades de Conservação (CNUC) do MMA/Brasil (June/2010).

34. It is important to clarify that this is a land use planning category.
35. TheKaieteur National Park, although it appears as Category II, it has some aspects of Category VI (6) as well. The Iwokrama park, is a Category VI since its main objective is sustainable use and conservation.

As evidenced on the previous table, each one of the Amazon countries shows the figures and categories of conservation with different names. Some sources indicate that, at least in the region, there are 23 different management categories that not only involve the protection of biodiversity, research, education and ecotourism, but also the management of forest resources as is the case of Brazil (extractive reserves and national forests), Colombia (forest reserves), French Guiana (Areas in sustainable use forest regime) and Perú (community reserve and reserved zone or area) (PNUMA *et al*. 2009).

Several countries of the Amazon region have ***adjoining protected areas,*** and in some of them cooperation processes are taking place, which generate an added value to the conservation of transnational ecosystems (Table 18).

The Systems of Protected Areas, the indigenous territories and permanent forest lands are most of the time the result of independent planning and only in limited cases their vicinity or overlapping has been the deliberate result of planning. However, co-occurrence of these figures in the territory establishes positive opportunities and synergies at landscape and Biome level, generating ***territories of conservation –TC***-, as emerging entities in the landscapes, already recognized as "conservation corridors", "protected area complexes" or "conservation mosaics[36,37] some of which are presented on table 19 (WWF, Fundación Humedales 2008).

Table 18. Adjoining Amazon region protected areas

Name of the protected area (AP) or situation	Countries
La Paya (Colombia – Güeppi (Peru) – Cuyabeno (Ecuador).	Colombia - Peru - Ecuador
Alto Purús natural reserve and national park (Peru) - indigenous land "Kampa e Isolados do Rio Envira" and "Riozinho do Alto Envira (Brazil).	Peru - Brazil
Sierra del Divisor National Park.	Peru - Brazil
Vilcabamba – Amboro Tambopata National Reserve and Bahuaja Sonene – Madidi National Park.	Peru - Bolivia
Itenz Guapote.	Bolivia - Brasil
Cordillera el Cóndor (Peru) – El Cóndor biological reserve, El Quimi Biological Reserve and El Zarza Wildlife Refuge (Ecuador) Nany – Pucacuro.	Peru - Ecuador
French Guiana Amazon Park–Montanhas do Tumucumaque National Park.	French Guiana - Brazil
French Guiana Regional Natural Park– Do Cabo Orange National Park.	French Guiana - Brazil

Sources: WWF, Fundación Humedales 2008, Direction Régionale de l'Environment (DIREN), 2010; SERNANP (2010).

36. Brazil has officially recognized the conservation mosaic entity, applicable to some areas of the Amazon.
37. WWF, in the ANI process, identifies some of these territories under the name of priority landscapes.

Table 19. Some conservation Territories of importance in the region

Country	Some important cases of conservation complexes or territories
Brazil	• The central corridor of the Amazon. • Alto Río Negro complex, which encompasses national forests and the Pico do Neblina National Park. • Great complex o conservation units in the northeastern part of the Pará State and in the West and Southwest part of the Amapá State, including the Montanhas do Tumucumaque National Park. • Great complex of UC and TI in the Tapajós – Xingu watershed, including the Terra do Meio Ecological Station. • UC and TI complex in the west of Rondônia. • Scattered complex of national forests in the high Purús. • Complexes of conservation units along the BR-163 and BR-319 highways
Bolivia	• The great mosaic in the western side of the country, amongst the Madidi PNN and the Amboró PNN (part of the conservation corridor of Vilcabamba – Amboró).
Colombia	• High Guaviare (PA complex around the La Macarena Special Management Area with several national parks, a District of comprehensive management and forestry reserve). • Piedemonte Andino – Amazónico (foothills) in the province of Putumayo (with possibility to extend to the eastern part of the Colombian Amazon).
Ecuador	• In the Andes – Amazon transition, a chain of PA in the eastern slope. • To the eastern part of the Ecuador Amazon, between the Yasuní NP and the Cuyabeno Reserve.
French Guiana	• Amazon Park. Forest in a good condition of preservation, adjoining the Tumucumaque in Brazil. The largest protected area of the European Union (Heart of 2 million hectares, areas of free adhesion 1,4 million), protection of local communities lifestyle. • Nouragues National natural reserve. Forest in a good condition of conservation, permanent site of scientific studies on forest ecosystems. • - Kaw – Wetland national natural reserve of international importance.
Guiana	• Iwokrama forest, zone of sustainable use
Peru	• The numerous TI (isolated in a forest matrix) and the National Reserves of Pacaya Samiria and Alpahuayo Mishana, in Loreto. • The great complex of the "conservation corridor" between Bahuaja Sonene and the El Sira mountain range, which includes different conservation modalities.
Venezuela	• AC great complex in the Amazon state.

Sources: WWF, Fundación Humedales 2008, Direction Régionale de l'Environnement (DIREN), 2010. Cadastro Nacional de Unidades de Conservação 2010 (MMA/Brazil).

EXPANSION PERSPECTIVES OF THE SYSTEMS OF PROTECTED AREAS IN THE AMAZON BIOME

In respect of the scenarios of growing transformation and of threats listed in the section above, the Amazon countries recognize that protected areas are one of the most efficient strategies for cultural conservation as well as that of ecosystems, habitats and species. However, some of these countries have not established priorities in their prioritization exercises of conservation areas for the Amazon Biome (Table 20).

National and regional conservation priorities in the Amazon Biome

In the framework of building an ecosystem based vision of biodiversity conservation for the Amazon Biome, the topic of regional opportunities of conservation is paramount. In that sense, progress has been made in structuring and consolidating a work group made up by focal points of the systems of protected areas

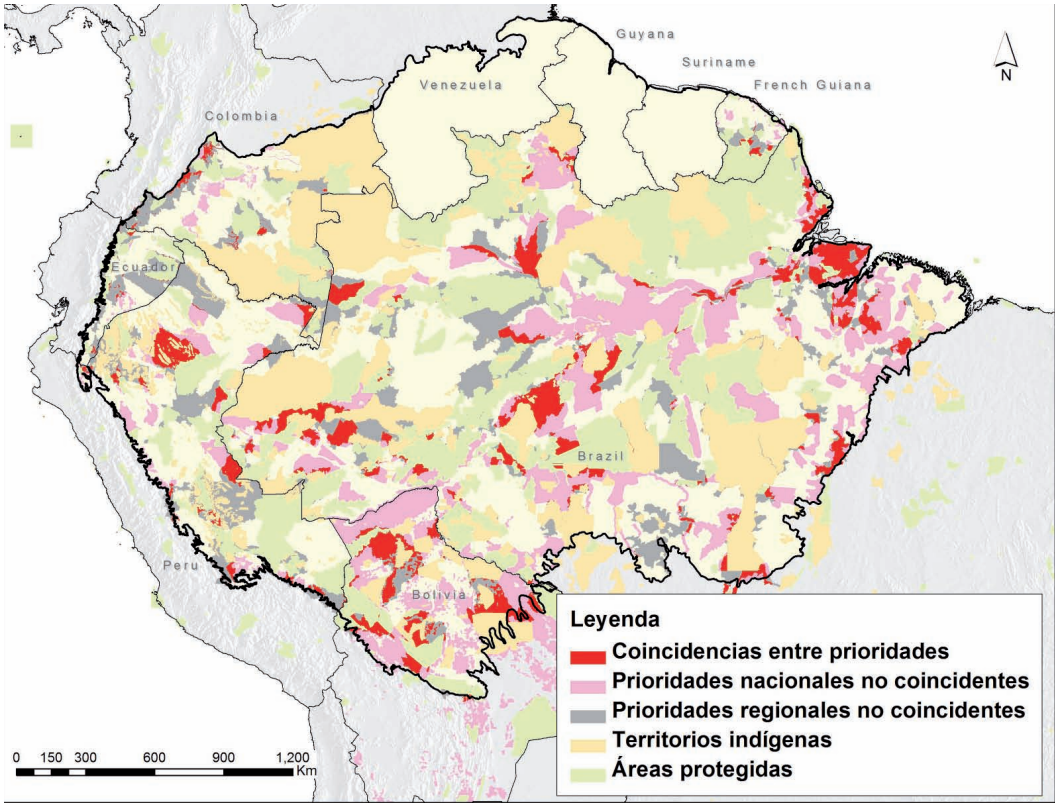
Table 20. Growth possibilities of the Systems of Protected Areas in the Amazon countries

Country	Comments
Brazil	• Large voids of representation of Amazon ecosystems in the PA systems. There are growth possibilities of areas, especially in areas of direct use. • Consolidation of conservation units, integrated into mosaics of protected areas. • Updating of priority areas for the conservation of biodiversity. So far, 334 priority areas have been identified which cover nearly 20.721.800 hectares among which 97 would be of sustainable use. Although, the comprehensive protection conservation units are more efficient in order to contain threats, the sustainable use units have a special meaning for the conservation of socio-diversity.
Bolivia	• 14 of the 16 Eco-regions defined in the country are properly covered, lacking PA in the puna and cerrado ecosystems (SERNAP 2006). According to the void analysis, the Amazon ecosystems are better represented; and the priorities lay in ecosystems outside the region. • Greater possibility to increase the TIs, even within the PAs.
Colombia	• Expansion process of the PNN Chiribiquete, with a comprehensive land use planning perspective, articulated with territorial entities and other environmental authorities. • Advances for the execution of a SIRAP strategy that guarantees connectivity between the Orinoquia and Piedemonte and Orinoquia and Amazonia. • Advances in the incorporation of a SIRAP in the sub region of the Piedemonte Andino Amazónico and implementation of a land use planning comprehensive strategy. • The consolidation processes of the Regional Systems of Protected Areas (SIRAP) are articulating the conservation priorities at regional (Prioritized areas in the planning instruments of the territorial entities and of the environmental authorities) and local level (municipal protected areas and protected areas of the civil society). • Execution of actions to declare the Mataven as a reserve, which guarantees connectivity between the Orinoco and Planicie Amazónica (Amazon Plains) Sub regions. • Important opportunities also through the creation of the PA by decision of the indigenous communities in their territories.
Ecuador	• According to the void analysis, the following areas in the Amazon still to be included in the SNAP, were identified: Cóndor and KatuKú, as Pastaza recreation and expansion of the Limoncocha biological reserve. • Ulloa et al. (2007) people say that of the 46 plant formations or ecosystems of Ecuador (sensu Sierra et al. 1999a), 39 are included, still to be represented in the country are the wet montane woodlands of the Amazon mountain ranges. • There is a low possibility to increase the Pas of the national system; relatively high in TI or protected areas of direct use.
French Guiana	• With the creation of the Guiana Amazon Park, the AP network covers more than 45% of the territory. • There are perspectives for natural sites (specially, the Abattis Cottica - area of the Maroni river, announced for 2010) • There is potential for protected marine areas but there are no projects at present. • It was also decided to protect the site of the Kaw mountain (with gold bearing potential) and a biotope protection area is under study. • In the future, the knowledge of certain habitats (coastal savahnas) is likely to allow for the proposal of new protection measures.
Guiana	• There is a challenge to expand the national PA system up to reaching 10% of the country´s surface. Currently, the protected areas represent 2,3% of the country´s extension. • There is more probability to expand forest management areas. • Two additional areas are being considered for protection: Shell Beach along the northern cost of the country and the Kanuku mountains to the southeast.
Suriname	• Some possibility through the PA of direct use (community use).
Peru	• The priority analysis defines biomes mainly beyond the Amazon domain, given that the PAs already have 20,5% of coverage in the biomes of rainforests (IUCN Peruvian Committee 2007). • The voids correspond to dry tropical forests (with only 2,9% of coverage), in some dry Amazon Inter Andean valleys, such as (Marañón or Huallaga). • The main representative voids (in % of larger types of habitats included in the SINANPE) correspond with ecosystems that are found beyond the Amazon region. • There is a high possibility for new areas, especially through PA regional systems, in San Martín and Loreto and potentially in other Amazon provinces. • There are fewer possibilities in Madre de Dios, where there is an important extension of PA at national level.
Venezuela	• More than 50% of the plant types are unprotected, mainly marine ecosystems and the plains and less in the Amazon rainforests. Given the large extension of the PAs (ABRAE) and of the actual PAs, an important level of growth is not expected in the Amazon region. • Low possibility of expansion, some potential in respect of the creation of a direct use and community PAs, or through the creation of indigenous territories.

Sources: WWF, Fundación Humedales 2008, DIREN 2010. Contributions of members of the editorial committee of this report (2010)

of the 9 Amazon countries, coordinated by REDPARQUES and supported by the World Wildlife Fund (WWF), the International Union for the Conservation of Nature (IUCN), among others. Said team has gathered to study in principle, the progress made at national levels on the analysis of gaps and identification of conservation priorities, as well as the results of the analysis of conservation priorities (land and freshwater) for the Amazon Biome, on which the WWF has made progress[38]. This has been recognized as input to move forward in the execution of priorities from a regional perspective.

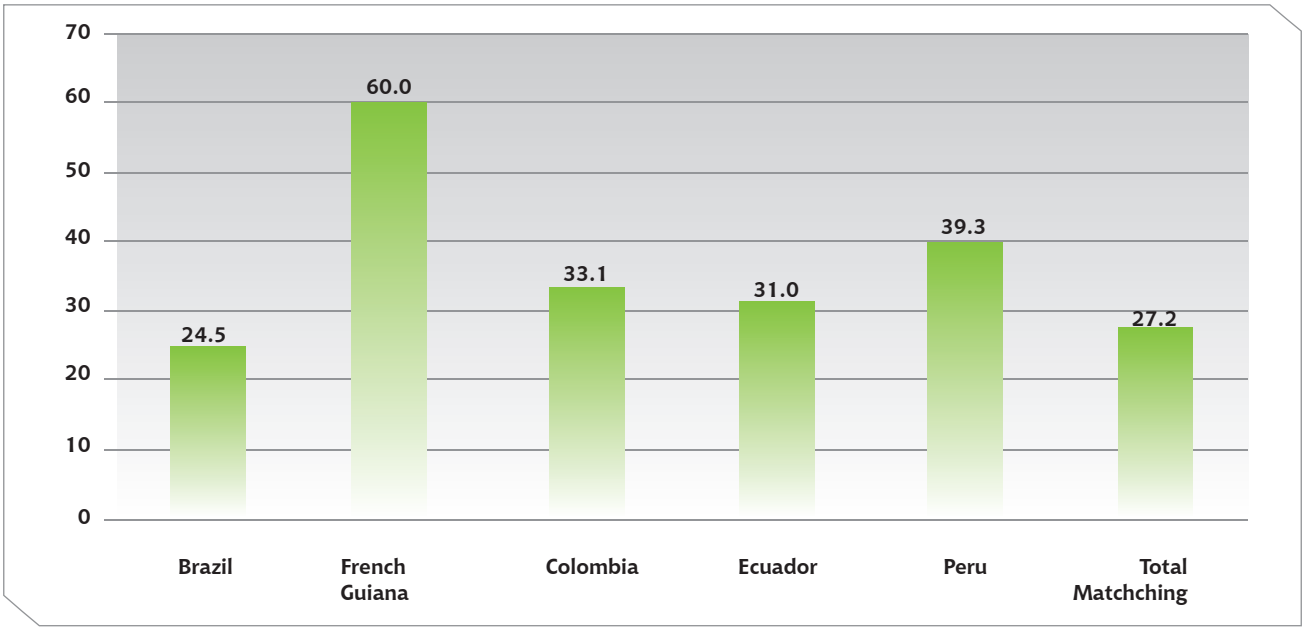
Progress has been made in identifying matches between national conservation priorities and regional priorities (figure 5). Those areas that match as a result of the national priority analysis versus the regional analysis are considered as priorities for regional and ecosystemic management of conservation. The results of the intersection analysis or of the space cross analysis between the exercises of the regional prioritized areas and of the national prioritized areas for Brazil, Colombia, Ecuador, French Guiana and Perú, show that in spite of using different conservation purposes and goals, nearly 27.25% of the national prioritized areas matched in respect of the regional conservation priorities (graph 4).



Source: Methodology proposal for the analysis of regional opportunities for the conservation of the Amazon biome. Redparques 2010.

Figure 5. Matches between national priorities of conservation and the regional analysis of conservation priorities

38. WWF´s Amazon initiative took into account the following criteria to identify the conservation objects in the Amazon Biome: ecosystems (irreplaceable resources, connectivity), processes (environmental services, regulation of climate and hydrology) and species (endemism, restricted distribution, threatened species, singularity and economic interest).



Graph 4. Matching percentage between the analysis of national and regional priorities

Source: Exercise proposal for analysis of regional opportunities for the conservation of the Amazon biome. Redparques 2010.
Note: Information of Bolivia in process of incorporation.

This exercise is projected to be supplemented entirely and functionally with other conservation figures and/or legal status of tenancies - occupation of land, as are the indigenous territories. Table 21 indicates some prioritized adjoining areas between the Amazon region countries, which can be an opportunity to move forward on transnational cooperation processes that allow for establishing conservation mosaics from a regional and from an ecosystemic perspective.

Table 21. Adjoining priority areas in Amazonian countries

Adjoining priority areas	Countries
Resex Rio Puré in Brazil adjoining the Rio Puré National Park in Colombia.	Brazil-Colombia
Hipona-Yaguas priority zone in Perú - province of Loreto adjoining the so called Amazonic trapezium in Colombia - adjoining the Amacayacu Natural National Park.	Colombia-Peru
Yavari-Mirin priority area in Perú – province of Loreto, which shares border with Brazil.	Peru-Brazil
Abujao-Tamaya corridor in Perú – province of Ucayali, adjoining Brazil with the Da Serra Do Divisor National Natural National Park and the Do Alto Juruá Extractive Reserve.	
Tucano comprehensive protection conservation unit and BR-174 estrada land use (lavrado/ Mucajaí/R. Parimé). Near the border between Brazil and Guiana.	Brazil-Guiana

Source: Exercise proposal for analysis of regional opportunities for the conservation of the Amazon biome. Redparques 2010.
Note: Information of Bolivia in process of incorporation.

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This process continues its consolidation, defining a set of steps to follow, analysis methodologies, as well as elements and criteria of representativeness, ecosystemic functionality and integrity. Among the elements and criteria proposed so far, we have:

- **Climate change:** Analysis of scenarios, vulnerability and adaptation.
- **Water processes:** freshwater ecologic systems and integration with land systems.
- **Species:** wealth and migration of species; ecosystem dynamics (for example migration of Bagres) biological, hydrological, financial importance, integrity, climate regulation, contribution to connectivity, among others.
- **Socio cultural:** Considering indigenous territories as conservation objects (those that are formally established and those of peoples who do not have contact with the outside world and live in voluntary isolation), where there are opportunities to protect biodiversity at the same time that vital space for their survival as traditional peoples is guaranteed. Similarly, quality of life and human health should also be included.
- **Political– economic element:** Integrating transnational initiatives. Agendas of cooperation agencies Local, national and regional development plans. Investment at these levels in the topic of protection and in the different categories of PA.
- **Strategic elements:** opportunities to strengthen bordering areas, possibilities to promote or to support the countries´ development or to support conditions of security food/ sovereignty (fishing stock, pollination, etc.). From the priority standpoint, one must work on the construction of scenarios in respect of high impact pressures (farming, roads, dams, oil and gas, mines, etc.) and must integrate as criteria the effectiveness in the management of the PAs.

Other sites which must be preserved from an ecological–regional perspective

From an ***ecological regional*** perspective (large landscapes and biomes), some additional conservation criteria and sites that complement the priority exercise performed so far, have been proposed (Table 22).

Table 22. Criteria to select sites of different levels for regional conservation

Criteria	Conservation attributes and functions	SImportant sites for conservation at regional level
Representativeness	It seeks to complement the national systems with a regional network, adding or emphasizing on certain sites through the analysis of gaps from a regional perspective.	**Tropical Dry Forest (TDF).** Considered as the most threatened system of the tropics It has not been prioritized in the Amazon region countries; although the region houses some of the most important areas worldwide, specially in Bolivia. There are also important TDF enclaves in the high Huallaga in Peru. **Savannas**. Prioritized in void analysis from Bolivia, Brazil, Colombia and Venezuela (especially in the transition of the Amazon Biome and Orinoquia or Cerrado). There is a high potential to include ecosystems of this sort in Bolivia in the high Madeira basin north of Beni, especially in the transition towards the rainforests and to the south in the transition to Cerrado in the upper part of the Tocantins basin. **Formations of the Guiana Massif isolated in the Amazon plains.** Ecosystems of "archipelago" spatial pattern in the Amazon plains. It is required that the representativeness of these ecosystems be considered not only with ecosystem type criteria in each country, but with an eco-regional and biodiversity approach as a whole. **Fog Forests.** Supplementing the representativeness of these ecosystems in the national PA systems does not guarantee the conservation of what is required to maintain the water and climate functionality of the Amazon basin.
Functionality of water systems	Including these sites that are essential to conserve the functionality of water systems[39].	**Fog forests and collection areas in the Andean–Amazon basins.** The conservation of functionality in the basins, at least in an important part of the Amazon foothills (piedemonte) and plains depends on the conservation of the riverbeds of the large rivers (Soares-Filho et al. 2006) to maintain a level of stability of the water systems, especially in the Andean– Amazon region rivers (whitewater rivers). There are eight sub-basins: Caquetá – Putumayo, Napo, Marañón – Huallaga, Pachitea, Ucayali, Madre de Dios, Beni and Mamoré. Additionally, we have the tributaries from the Northern part of the Amazon whose source is in the Guiana Massif and that form the large basins of Río Negro, in addition to other minor rivers in Acre. To the south, we have the large basins of the Xingu and Tocantins rivers that are originated in the Brazilian massif. **Fluvial dynamics in the alluvial plains.** As support in the maintenance of an adequate hydraulic regime. Additionally, it is necessary to consider the conservation of the riverbeds of black or clear water rivers that originate in the Amazon.
Macro-regional ecological connectivity	Including sites or areas that are essential for the maintenance of connectivity processes at a macro-regional high scale.	The current transformation scenarios including the most pessimistic ones, identify some large blocks[40] where there is a higher probability of maintaining ecosystems: • Guiana massif and projection into Brazil to the south toward the Amazon river • Northern of Brazil continuing to the south and center of the Guiana. • Rio Negro Basin in Colombia and in Brazil. • Northwestern Amazon in Colombia (basins of Caquetá –Japura, Putumayo Ica rivers and northern of Perú). • Basin of the Purús river. • Block in the centro – sur forest of Perú, with partial connectivity (especially throughout the Andes) towards the northern part of Bolivia. • Some large blocks in the Amazon south and east of Brazil are surrounded by road infrastructure works. **Connectivity between the Andes and the Amazon.** This is the highest regional priority because it represents an irreplaceable functional unit. There are two sites of high importance in this sense[41]: the high Guaviare river in Colombia and the Andean-Amazon foothills and the Amazon plains to the south of Bolivia. **Amazon– Orinoquía connectivity.** Important conservation options of this transition are given in Colombia - Andean transition– Amazon in La Macarena, and in the transition of the forests to the savannas to the northern part of the Vichada river. **Connectivity between Amazon and Cerrado.** High priority zone for Brazil, because it corresponds with the so called "Deforestation Arch" located between the Tapajos and Tocantins rivers, in the influence zone of the B-163 highway (Cuiaba – Santarem)[42]. If deforestation continues, this large block would end up isolated from the Amazon Biome. **West Guiana , Amazon and high Río Negro shield.** With zones of protected areas: national parks, forest reserves, natural woodlands with high lumber production, some sites are under pressure due to gold mining. **Bolivia – Brazil and High Purús complex.** Large complex of PAs and indigenous land. The entire zone represents the most important natural ecosystems area of Rondonia and of the southwestern part of the Brazilian Amazon, of great importance to avoid the fragmentation and separation of this large block into two different portions. There are many connection possibilities between the different conservation areas and protected areas in the region to generate large conservation landscapes under different definitions (corridors, mosaics, etc.) and modalities.

Criteria	Conservation attributes and functions	SImportant sites for conservation at regional level
Support of climate processes	Zones identified as essential to maintain climate processes with regional effects	It is urgent to identify in the Amazon basin, the areas of great influence in current climate functionality.
Maintenance of biotic phenomena at regional scale.	Zones that support biotic processes at regional level.	The conservation of habitats key for the fauna, has not been considered in any of the conservation voids analysis However, it is necessary to maintain biotic processes, especially of species that represent important movements such as bird migration, migration of large river turtles and "reofíticos" fish. Conservation of these processes requires the correct location of the AP, ecologic management of the landscape, especially the large routes (rivers) that guarantee the macro regional connectivity of the process.

Source: WWF, G Andrade, Fundación Humedales, 2008.

Additional conservation scenarios

There are also opportunities to bring conservation strategies into other scenarios as are the agro-ecosystems and the areas with infrastructure development. In the areas ***transformed into ecosystems*** and in those which have been abandoned, conservation actions would have several purposes (WWF, Fundación Humedales 2008):

- As contention zones against the expansion of threats on the large blocks[43].
- Conservation of specific biodiversity.
- Generating an ecological support structure for productive processes.
- Restoration of ecological processes and improvement of climate conditions (CCG mitigation and adaptation thereto).

In this sense, a conservation strategy is important – restoration in the eastern side of the Amazon (the so called "deforestation arch"), in Brazil; attending to representativeness criteria of ecosystems that do not exist in the rest of the Domain and especially to the function of the forests in the current climate balance of the system.

A strategy of this type should include extensive restoration and reforestation programs, as well as the design of an ecological structure to recover connectivity in the relicts and PAs. This consideration is supported by the need to connect in this region (as well as for the Andean foothills located between Colombia and Perú), the conservation proposals with development proposals, considering the fact that many of them have been object of what Neps-

39. One of the biggest challenges in the planning of conservation in the Amazon basin, is the integration in the models used to prioritize areas, land ecosystems and aquatic ecosystems. This not only in terms of representativeness of biodiversity but also in terms of maintenance of functionality of the ecosystem as a whole and of the large sub-basins. Some functionality attributes are the water regulation in the basins and the climate - fluvial dynamics as factors of permanent formation of ecosystems in the alluvial plains.
40. Defined as those larger than 500.000 ha (WWF Priority Initiative).
41. Which due to their location at the latitudinal end points (northern and southern end point) of the Amazon Andean, it is evident that in terms of biodiversity, they may be irreplaceable.
42. According to different studies as those of Carlos A. (Instituto Nacional Brasileño para la Investigación Espacial), Steven C. Wofsy (University of Harvard) this area is also particularly sensible in respect of CCG.
43. Defined by ANI as "threat mitigation landscapes".

tad calls "unproductive deforestation"[44], which already reaches a high percentage of the transformed surface (Ibid p. 28).

In the scenarios of ***development of infrastructure,*** conservation strategies could be given through improving the performance in matters of environmental impact. It is urgently required to integrate the impact mitigation programs through environmental licenses, or in some cases to redefine some of them based on a strategic environmental planning perspective. This way, the trans-national development undertakings may constitute an opportunity to gain in environmental governance. Among the elements that should have a conservation strategy connected to IIRSA we would have: a) land use planning, with ecosystem conservation components in all development enclaves, extractive enclaves (hydro- power, mining); b) generation of biological corridors and of connectivity networks through rural productive landscapes, with a special location between the large conservation blocks; c) PA consolidation. Lastly, the existence of large areas of land, previously covered by forests and today with a very low productivity; called by Nepstad et al (2006) as "unproductive deforestation" cannot be ignored (WWF, Fundación Humedales 2008).

Element 2.

Governance, participation, equity and share in benefits

GOVERNANCE IN THE PROTECTED AREAS OF THE AMAZON BIOME

In legal terms, the governance of protected areas *is defined* as the legal-institutional frameworks, structures, knowledge systems and cultural values that determine the way in which decisions are taken, the participation mechanisms of the different players and the ways responsibility and the power of the protected areas are exercised. This definition encompasses at least seven elements that help describe the situation of governance of the national systems of protected areas (SNAP) Table 23 (Alex Rivas, comp. 2006).

44. These are areas of land, previously covered by forests and that have low productivity today.

Table 23. Elements that help describe the situation of governance of the national systems of protected areas

Elements that describe the Governance in the SNAP	Description
Legal-institutional frameworks	It is about understanding the legal-regulatory frameworks that regulate the administration and management of national systems of protected areas with special emphasis on decentralization and dispersion processes.
Levels of authority and instances in the decision making process	It includes the description of roles and responsibilities of the different instances involved in the decision making process according to the decentralization structures and to the political-administrative division of each country.
Participation mechanisms	Participation of local and regional governments and the participation mechanisms and instruments of Governance of the SNAP, indigenous peoples, local communities, the private sector and other players involved. The objective is to know the legal and institutional framework and the mechanisms for participative management of protected areas, which include co-management, participative management mechanisms (management committees and others) and the administration of same.
Rendering of accounts and transparency	Analysis of monitoring and evaluation mechanisms of public processes in the management and administration of the national systems of protected areas, as well as the participation of the civil society in these processes, access to information, existence of monitoring committees, execution of public hearings and other forms of citizens action.
Land tenancy	It analyzes the regimes of ownership, access, use of land and of renewable and non renewable resources. It includes tenancy conflicts in protected areas and in indigenous territories, as well as tensions caused by mining and oil concessions in protected areas.
Training skills and needs	The needs of skill strengthening for administration and management of protected areas and environmental governance are described.
Financial sustainability	Reflections on public investment in the SNAP are included. The existence of mechanisms such as trusts, sale of environmental services in the PAs, debt restructuring, incentive systems and others is considered. This analysis must be related to autonomy levels in the management and decision making process at local level It includes a reflection on the role of international cooperation in the management of protected areas.

Source: Alex Rivas, comp. 2006

Legal– Institutional frameworks that enable the existence and the management of PAs in the Amazon

The group of Amazon countries has legal and institutional tools and regulations that support participation and decentralization in the creation and in the management of PAs (table 24). However, these do not ensure an efficient management. Some states have serious restrictions in enforcing the regulations due to the fact that some of them were created without sufficient consensus and social participation; there is a lack of connecting standards and strategies to promote synergies and complementarities; there are limitations in the institutional capacity at regional and local level[45]; there is also a shortage of efficient operational and administrative frameworks.

45. Most of the institutions at these levels and even the organizations of the civil society are not sufficiently well consolidated and quite often they do not have technical information necessary to lead management processes in protected areas.

Table 24. Elements that describe the Governance of NPA systems of countries that share the Amazon region

Country	Element: Legal - Institutional frameworks
Bolivia	It has legal bodies supporting the participation and the conservation, but there is no express law for APs and for the conservation of Bio-diversity.
Brazil	Federal Constitution of 1988 assigns the Public Power the definition of territorial areas to be protected. Law N. 9985 of 2000 established the National System of Nature Conservation Units (SNUC), regulated in 2002 by Decree N. 4340. In 2006, the National Strategic Plan for Protected Areas (PNAP) was published; it defines principles, guidelines, goals and strategies for implementation, including Conservation Units (UC), indigenous lands and territories of African-descending communities (quilombos). Even though quilombos and indigenous lands are not considered APs, its importance is acknowledged for the conservation of bio-diversity. Law N. 4.771, of 1965 (Forests Code) recognizes as conservation areas within indigenous territories, natural vegetation areas for the maintenance of the necessary environment for the life of indigenous communities.
Colombia	It has a robust legal system which makes social participation and decentralization of APs viable: social participation in conservation law - parks with people (1993) Optimum application still in process.
Ecuador	The Natural State Areas heritage (PANE), is regulated through the Forest Law for the conservation of natural and wildlife areas. It has a legal system which supports social management and participation.
French Guiana	The Environmental Code is a very thorough instrument, regularly updated. It rules on general aspects as well as on mechanisms for the creation of protected areas. Each type of protected area also has its own regulations.
Guiana	There is no legislation on PAs. There are two protected areas and each one has its own legislation. The Environmental Protection Agency oversees national PAs.
Peru	It has important legal instruments which support decentralization and management of PAs: ANP Law with its regulations and plan. Nevertheless, decentralization processes regarding PAs have been intermittent.
Suriname	
Venezuela	It has an extensive environmental legal framework as well as on social participation, which makes it a pioneer.

Country	Element: Levels of authority and instances for making decisions
Bolivia	SERNAP manages PAs. It has its own operational structure, with national competence, functionally dependent of the Vice-Minister of the environment and natural resources.
Brazil	The MoE (MMA), is the entity responsible for the formulation of public policies for CUs. Brazil is a federation which comprises 26 states and one Federal District. Within the Federal sphere, Chico Méndez institute for the conservation of bio-diversity – ICMBio - is in charge of the management, protection and surveillance of CUs. In the states and at the municipal level, there are generally secretariats for the environment which coordinate actions in accordance with the Ministry›s guidelines. Quilombos› lands are recognized, limited, marked and titled by the National Institute for Colonization and Land Reform (INCRA), linked to the Ministry of Land Development. Indigenous lands are determined by the National Indigenous Foundation (FUNAI), linked to the Ministry of Justice. Currently, the MMA has effective participation in conjunction with FUNAI in the production of the National Environmental and Territorial Management Policy on Indigenous Lands.
Colombia	Ministry of Environment, Housing and Territorial Development (MAVDT) is the highest authority. It acts through the special administrative unit of the national natural parks system (UAESPNN), in coordination with Regional Environmental Coordinations (CAR), departments and municipalities.
Ecuador	The Ministry of the Environment, through the National Heritage Sub-Secretariat and the National Directorate of Bio-diversity. Municipal governments also share some level of competence.
French Guiana	The Ministry of Sustainable Development has authority over most PAs. There is a consultation process with local authorities and participants. Regional communities also direct the regional NP and they have the possibility to create regional ANPs. Every decision regarding the creation of National PAs and validation of management plans are authorized by the national council for the protection of the environment, independent from the Ministry.
Guiana	APs are managed through several mechanisms: i) Board of trustees (government, community and international representatives ii) Board - Kaietur National Park. administered by representatives of the National Committee, under the direction of the presidency of the republic.
Peru	ANPs which are part of SINANPE are under the administration of SERNANP, entity attached to the Ministry of the Environment (MA). There are two more administration modalities: Regional Administration Natural Protected Areas (ACR) and private administration NPA (ACP).
Suriname	The Ministry of the Environment is the entity responsible for the formulation of public policies for PAs and therefore it is the maximum authority.
Venezuela	INPARQUES, is the institute responsible for PAs. It depends of the Ministry of the Environment and Natural Resources. It operates relatively independent.

Country	Element: Participation Mechanisms
Bolivia	Management Committees, Joint Administration Agreements, Management Plans and POA with the participation of local communities; participation is also promoted through the incorporation of local personnel in the management of parks and reserves.
Brazil	SNUC Law set forth public consulting for the creation of CUs. During these consultations, the government informs the population about the consequences of the creation of the unit. There is a management support committee in each CU. It is made of people from the community, the civil society and other local governmental instances. At the national level, it is the National Environmental Council (CONAMA) who establishes rules for the implementation of environmental laws. CONAMA is formed by civil organizations, representatives of other governmental sectors and private sectors.
Colombia	There are co-management and co-responsibility agreements between the UAESPNN and the civil society (private areas). Co-government is given specially in overlapping areas through mechanisms such as the Special Management Regime (REM). Co-management in areas delegated by public authorities to non-governmental institutions.
Ecuador	The unified text of secondary environmental legislation considers the creation and operability of Management Committees as a tool which allows participation of the civil society in managing protected areas comprising the State Natural Areas Heritage.
French Guiana	For natural reserves, there is a management committee formed by the different players which meet for agreements (twice per year) - The national park has a very large committee, directed by a representative of local communities. It meets three times per year. Additionally, a local life committee is being created in each populated area for the everyday participation of all actors.
Guiana	There are representatives of the Board in support of community projects and management.
Peru	Local participation in the management of resources, voluntary park rangers, community surveillance, management committees, etc. Civil participation: Administration contracts, service provision contracts, Management Committees, agreements with inhabitants, agreements with NGOs, creation of ACRs, etc. There is a special co-management regime in the community reserves and prior, free and informed consultation is carried out.
Suriname	An effective participation policy has been developed with communities in the development of PAs. This has been achieved through consulting commissions.
Venezuela	Public consulting for the design of POTs; pressure campaigns in favor of PAs; voluntary brigades, technical internships and Missions (public policy initiative promoting the participation in urgent issues): Guaicaipuro (survival of indigenous communities) and Tree Mission (conservationist awareness and support to productive reforestation).

Country	Element: Statements of Accounting and Transparency
Bolivia	There are isolated cases, but there are not statement of accounting processes.
Brazil	There are courts of law implementing the transparency accounting system. There is an internal control system at the Ministry of the Environment (MMA) on the financial flow of transfers to states, municipalities, projects and funds.
Colombia	Public hearings, access to information, official, citizens oversight; recall of state officials; town meetings; writ of amparo.
Ecuador	Administrative and financial processes of the Ministry of the Environment are controlled by an audit system, based on annual operational plans fulfillment reports - POAS -
French Guiana	Each PA produces on an annual basis a management report; it is validated by the Management Committee. An independent scientific council gives its opinion on actions at the PA. European Law establishes that environmental information should be published.
Guiana	Meetings are held to present periodical and annual reports to the Board; comments are published and accessible for communities and general public.
Peru	Even though the National Environmental Council and the Coordination Council are instances which conduct transparency forms, this is still an incipient process.
Suriname	
Venezuela	Statement of accounting is given through the disclosing of the MARN›s Annual Report and Accounting, at the disposal of the public through a web site.

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Country	Element: Possession of Land
Bolivia	A large percentage of the population (especially indigenous) live within PAs. There are indigenous and and rural migrations towards PAs. The INRA Law states the right of possession over the land and recognizes private agricultural property in favor of natural or legal persons to exert their rights in accordance with the National Constitution. In community lands, use of the soil›s natural resources is guaranteed, but use of subsoil´s NR is not.
Brazil	Advances are being made in a "PA territorial consolidation" process aimed at overcoming overlapping issues between protected lands and other public lands, such as indigenous zones, Land Reform settlements or lands recognized as surplus of African descending populations (quilombos). Even though the right to the possession of indigenous lands and to the usufruct of their resources, land property remains on the Federal Government.
Colombia	There is territorial overlapping between PAs and indigenous territories. This situation implies the construction of a special management regime articulating life plans of indigenous populations with APs´ Management Plans. Subjects such as prior and informed consulting are also included. There are agricultural populations in some PAs, with property titles and possession.
Ecuador	As the declaration of protected areas has been made in the last 30 to 40 years, PAs have several types of possession therein, among them, ancestral community and private properties. These possession forms are recognized by the State, excepting possession of colonists which have no legal support. The state is currently interested in organizing the possession of private lands within PAs.
French Guiana	Most lands are public property (national land). Local communities are allowed to use Natural Resources. This also happens at the Amana national reserve, of Kaw, as well as in the Amazon Park. The forest regime allows the creation of community forests, with property and technical management given to communities (National Forest Document (ONF).
Guiana	Indigenous communities in Guiana own their land. These territories are only included within the PA if requested by communities. Indigenous groups have the right to use PAs resources with traditional purposes, for example, hunting, fishing, etc.
Peru	It has legal mechanisms and conflict resolution mechanisms for the case of private property within PAs. Indigenous territorial reserves are created to safeguard people in isolation or in the first stages of contact from eventual forceful contacts due to extractivistic colonization initiatives. Industrial intervention is allowed in some PAs.
Suriname	
Venezuela	This is the most controversial element in PAs. There are disagreements regarding limits and indemnities. There are advancements regarding indigenous territoriality. Overlapping with indigenous territories and PAs is high. It has important OT articles which facilitate the development of inhabitants inside PAs. Industrial extractivism constitutes one of the main territorial conflict sources within protected areas.

Country	Element: Skills and training needs
Bolivia	It demands training to park rangers, communities and local organizations in: APs' management and administration, social control, leadership generation, human rights, administration, decentralization, citizens participation, as well as hydrocarbon exploitation, mining, agro-industry and forest exploitation.
Brazil	Recently, a training process was started for deliberating community councils in extractivistic reserves. In 2009, ICMBio, managerial organ of federal Conservation Units, inaugurated the National Bio-diversity Academy with the purpose of executing managerial development programs for the organism, to produce and to execute initial training programs for the career of environmental specialists and of constant and continued education for their officers, as well as technical counseling for the execution of training events for the development, training and updating of managers and officers.
Colombia	Training aimed at the strengthening of co-management processes. Specifically in: decentralization, public administration, duties and rights around bio-diversity and natural resources.
Ecuador	The Ministry of Environment, has a training plan at different levels: park rangers, area chiefs, technical and support personnel who have been managing and administering the PANE´s PAs. This plan is being implemented with the support of public and private institutions.
French Guiana	Network development within the French Guiana. Needs to strengthen training on social subjects and in connection with citizens participation.
Guiana	
Peru	It has a training strategy valid from 2005 to 2014. Some priority subjects therein are: social participation in administrative and technical management of PAs; administrative regionalization, decentralization and management of parks and reserves. Aimed at strengthening communities´ management capability, organizations of producers and other local populations; it is aimed at improving their knowledge, skills and attitudes to identify and face threats and opportunities.
Suriname	
Venezuela	Training is a constant promoted from different instances. The following are priority subjects: society and conservation, ancient knowledge and traditional cultures, governance, democracy, social participation and social controlling.

Sources: Alex Rivas Toledo, comp (2006); proceedings workshop on construction of conservation vision of the Amazon Region. August 28 - 30, 2008; Ministry of the Environment of Brazil/ Bio-diversity and Forests Secretariat / Department of Protected Areas. 2007; UICN. 2006; UICN. 2010. SERNANP, 2010. Also complemented by representatives of the editorial committee in workshop carried out in March25 and 26, 2010.

In the region, decentralization is especially evidenced through three highly differenced schemes: i) public management decentralization with other instances and governmental authorities from the Central level, giving opportunities for statements, administration and management to local and regional spheres, ii) decentralization from the central level in regions and towns within the country and iii) co-management, that is to say, sharing administration and/ or management responsibilities with other public or private actors, or with communities. In this process, appearance of new political players for protected areas is positive, such as local governments and local community organizations, nevertheless, transfer of environmental competencies, generation of appropriate co-government frameworks and the implementation of practical and institutional mechanisms which facilitate governance, are still goals to be reached (Alex Rivas, 2006). Even though practically in all countries in the region legislation incorporates the concept of decentralization as mandatory, there are no specific decentralization schemes in the Law. Colombia and Perú have legal possibilities to declare areas at several levels, even though, there are still difficulties and legal lacunae, especially for the municipal level. Regulating improvements in Colombia, such as incorporating the civil society in the declaration of their lands into a category of protected area, are worth mentioning: Natural Reserve of

the Civil Society, even though there are still issues with the regulation, especially regarding incentives for conservation.

Even though there are legal and institutional regulations in the region for managing PAs, a general problem is their weak development, which makes them flexible and which facilitates the intervention in these venues of business sector activities such as mining, oil and forest exploitation, etc. that turns good governance into a far fetch goal. This is more noticeable in protected areas where the population inhabiting it corresponds to local communities and/ or areas with small populations. In indigenous lands, the scenario changes a bit, as these communities have legal mechanisms to support the defense of their territories.

Levels of authority and instances for making decisions

The figure of authority and decision making is generally handled by Ministries of the Environment, which in turn delegate administration and management on institutes, secretariats or units. They differ in the degree of autonomy, the size and the scope of their work, as may be seen in Table 25.

The Colombian case is innovative on the subject of levels of decision and authority as it joins hierarchic levels of public administration in which the regional environmental authority is legitimately recognized, as well as traditional indigenous authorities existing in the numerous protected areas.

Participation Mechanisms

Social participation is understood as those processes that facilitate the incursion of social players -outside the State – in planning, administration and management of protected areas (Alex Rivas, 2006). There are several co-management, co-administration and consulting modalities in the different national systems of protected areas (Table 25).

The co-management concept implies "a wide range of options: from placing control functions on the side of State agencies, to placing them on the community side; the degree to which each party assumes its duties, rights and responsibilities depends on local conditions, on each party's conditions and on the negotiating conditions. At the same time, co-management also implies a continuum, a notion of process - normally in the long run - aimed at going from an initial majority control by the State, to a final situation of maximum control by the community" (Oviedo 2004, In: REDPARQUES 2007). This author identifies the following co-management modalities:

- Territories with total or partial autonomous indigenous management;
- Co-administration;
- Delegation;
- Partial co-administration;
- Partial delegation;
- Scheduled Thematic Participation.

Alex Rivas (comp. 2006), points out that it is necessary to develop and disseminate in the region, not only concepts and methodologies of social participation, but actual cooperation practices between institutions and civil societies of protected areas. It also says it is noticeable the lack of data on the participation of the private sector, entrepreneurs and productive chambers in the management of parks and reserves, and that the social participation practices respond, at certain times, more

to the desire of certain social players (before specific situations) rather than to an inclusive state vision in the managerial decision making.

The practice of a real participation is given if there are parallel levels of knowledge and experiences on the subject and within the geographic space where decisions are made. This requires, therefore, the creation of permanent processes in the region and at the institutional and social levels for the technical, operational and financial strengthening.

Statements of Accounting and Transparency

Statements of accounts processes and transparency exercises in managing protected areas are poor in most countries sharing the Amazon Region (Table 25). It is common to find that statements of accounts are similar to the distribution and/or access to information from authorities to citizens.

It would be important to look for an extension towards protected areas of social control systems currently ongoing with important results in local governments of countries like Brazil and Colombia.

Land Possession

There are different forms of land occupation in protected areas of the Amazon Region: community and private territories; legalized, non legal areas or areas being legalized; areas with indigenous and African descendants' communities and communities with mixed agricultural workers. In said geographic spaces, it is common to find different conflicts where overlapping between protected areas and collective territories, as well as extractive industrial activities are the most common ones.

Regarding indigenous communities, five types of overlaps have been found: **a)**indigenous territories in protected areas already been legalized; **b)** other at any point of the process of legalization, awarding or legal organization; **c)** territories inhabited by communities and indigenous peoples with certain level of recognition as being considered possession and traditional use areas **d)** territories where there is participation of indigenous in co-management, co-administration or concession mechanisms of overlapping protected areas and **e)** those giving indications of a certain level of recognition due to the participation of indigenous people in Management Committees or similar figures (UICN, 2010).

Most Amazon states have moved forward in the creation of formal venues and means which partially establish indigenous participation in the governance of protected areas. Table 25 shows some elements of national legislations which determine said participation. These elements are related to the existence of a national system of protected areas; with the general recognition made by nations of the situation of indigenous peoples and their rights, as well as with the influence indigenous territories may have within the national systems of protected areas (UICN, 2010).

Recognition of ancient territoriality has facilitated the establishment of agreements and, in general, environmental governance. Recognition modalities of the rights to the land are diverse, in wide terms, the following have been identified: i) titles which recognize perpetual

collective possession of lands with the capability to apply their own forms of government (In Colombia, Ecuador, Peru and Bolivia,); ii) Titles indefinitely recognizing the right to use lands and renewable natural resources and to maintain their own

Table 25. Legal conditions for indigenous governance in protected areas of the Amazon region.

Legal Elements	Bolivia	Brasil	Colombia	Ecuador	French Guiana	Guiana	Peru	Suriname	Venezuela
Legal existence of a PAs national system	**Yes** Law of the Environment 1333	**Yes** Law 9985 modified By law 11132 and Decree 5566	**Yes** Law 99/1993	**Yes** Forest Law of 1981	**Yes** **Environmental Code**	**No**	**Yes** Decree 1013	**No**	**Yes** Organic Law: for the Organization of the territory GO 3238
Constitutional recognition of indigenous peoples as subjects of rights	**Yes** Art. 2	**Yes** Art. 231	Art. 171, 176, 246 and 330	**Yes** Art. 4, 5, 6 and 8	**Yes** French Constitution, declaration of human rights of 1789	**Yes**	**Yes** Art. 89	**No**	**Yes** Art. 119
Recognition of the right to possession and to use of Natural Resources in PAs in the national legislation	**Yes** General Regulations of APs, Art. 24781 Art. 9	**Yes** Law 9985 Art. 42 and Decree 4340 Art. 39	**Yes** Decree 622 of 1977 Art. 7	**Yes** Law of Agricultural Development of 1994 Forest Law Art. 87	**Yes** Prefectural Decree of 1971 and Ministerial Decree of 1987	**Yes** Amerindian Act 2006, Chapter 29	**Yes** Supreme Decree 009-2006-AG	**Yes** Decree on Land Policies of 1982	**Yes** Organic Law: for the Organization of the territory GO 3238 Art. 23
Recognition of ancient/ traditional/ own authorities in the national legislation	**Yes** Law of Popular Participation 551	**Yes** Constitution Art. 231	**Yes** Constitution Art. 246 Law 99 Art.31	**Yes** Consti-tution Art. 171	**Yes** Consulting Council of indigenous peoples ("peoples autochthones")	**Yes** Amerindian Act of 2006	**Yes** Constitution Art. 149	**No**	**Yes** Organic Law of Peoples and Indigenous Communities LOPCI Art. 6
Recognition of common law in their territories	**Yes** Constitution Art. 192	**Yes** Constitution Art. 231	**Yes** Constitution Art. 246	**Yes** Consti-tution Art. 57	**Yes** Filoche and Aubertain 2007:7	**Yes** Amerindian Act Section 2	**Yes** Constitution Art. 149	**No**	**Yes** Constitution Art. 260
Existence of legally defined mechanisms for the participation in the management of APs	**Yes** Law 1551 Art. 7. Law 1333 Art. 78 and General Regulations of APs	**Yes** Law 9985 Decree 4340, Art. 17	**Yes** Law 99 Art. 31	**Yes** Law of Environmental Management of 1999, Art. 12	**Yes** Decrees of the creation of inhabited PAs or PAs with population nearby (l National Amazon Park, RN of Kaw, RN of Amana)	**Yes** Acts of creation, modification and protection of Iwokrama and Kaieteur areas.	**Yes** General Environmental Law 28611 Art. 108 and ANP Law	**No**	**Yes** LOPCI. Art.

internal government systems (Brazil) and iii) Community titles within the framework of agricultural legislations or other in the Civil Code in which no options for their own administration are granted to indigenous peoples, but they are given the same treatment as individual owners or peasants (REDPARQUES 2007).

Nowadays, large extensions of land in the Amazon Region are spaces of exclusive property or use of indigenous peoples. Nevertheless, for these communities, restricted recognition of their right to possessing and to using resources results in limitations to their self-determination and to the definition of their own development

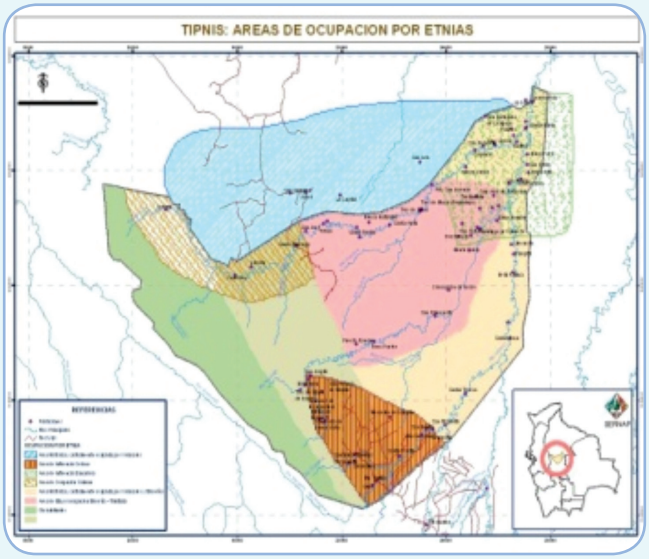
visions. Reaching titles and recognition of the property has been seen as a way to guarantee a greater control over the territory, to protect natural resources against expansion of third parties and to guarantee venues for life and for cultural continuity among future generations.

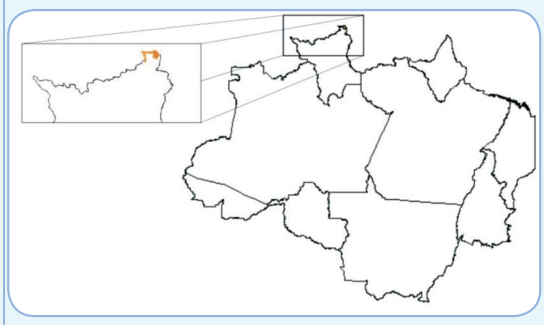
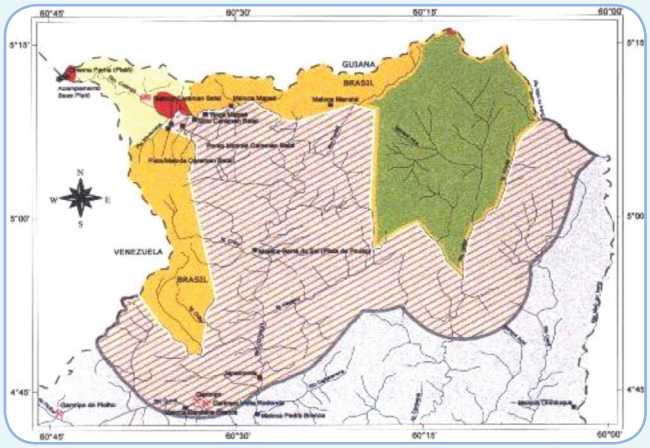
Some countries of the Amazon Biome (Bolivia, Ecuador, Guiana, and Peru) recognize the capability of indigenous territories to contribute to the conservation of natural resources and bio-diversity, and this recognition is made through the incorporation of areas preserved by indigenous communities to national PAs' systems. Connecting collective territories to national conservation policies, maintaining sovereignty of peoples and communities, either indigenous, African descendents, tenants, etc., is also mentioned as an option, as well as facilitating civil society and government in complementing one another to create more appropriate environmental leveraging, as well as effective environmental governance processes in PAs. Table 26 describes some examples of governance situations occurring in protected territories and areas in the Amazon Region.

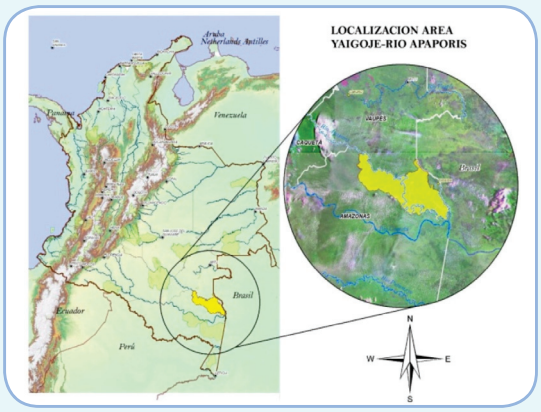
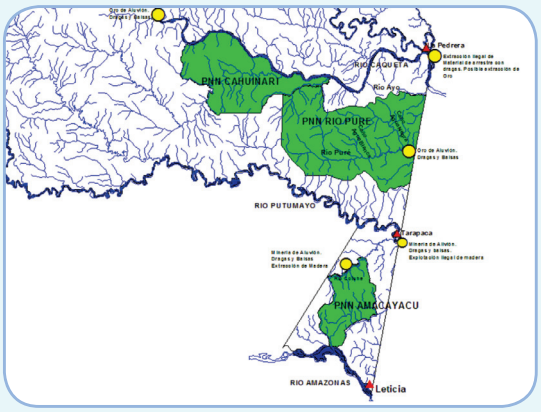
Carrying out extractive industrial activities within protected areas and collective territories is another conflicting factor which conciliates governance and land tenancy in protected areas. Oil, gas, mining and other forms of industrial intervention are present in all systems of protected areas within the region. The problem of mining in parks and reserves does not imply only of the environmental risk associated to the large scale use of non renewable natural resources, but also in the intervention of other political players and in the modification of the composition of social players present in protected areas. This factor is considered in all states as a strong political, territorial and legal constrain which threatens the possibilities for a good government (Alex Rivas, 2006).

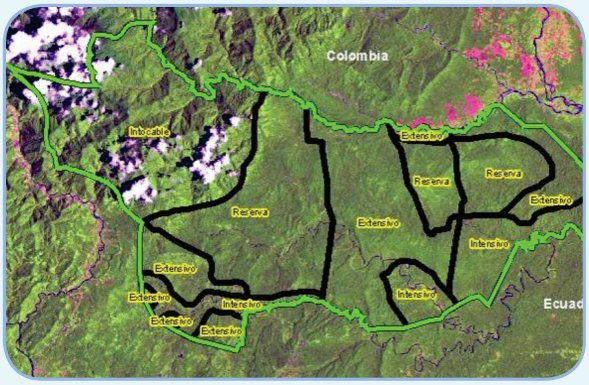
In that sense, contributing to real governance and to reducing conflicts when using and occupying lands and natural resources, it becomes necessary to develop and/ or strengthen legal frameworks and public policies in accordance with the social-cultural and economic conditions of the APs' systems and of the conservation territories, as well as participative management, planning and territorial organization processes which integrate collective territories (indigenous, African descendants and others) and which may go beyond the economic rationality supporting the current development in the region.

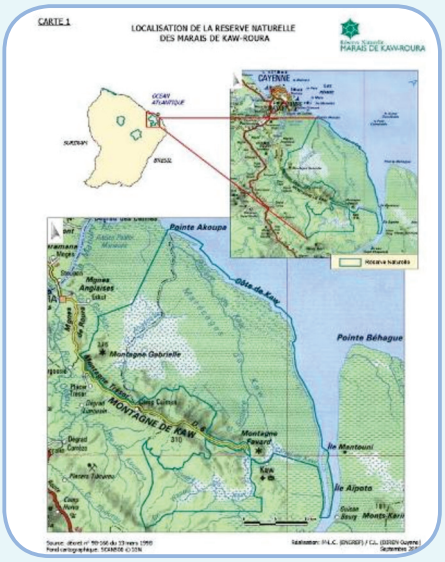
Table 26. Situations of Governance in some Amazon region protected areas - general context and case studies

Country	General national context of APs'governance	Specific experience of governance situations
Bolivia	• About 70% (116.000 inhabitants) of the population inhabiting APs are indigenous, peasants and natives. • There are 14 indigenous territories overlapped with APs • It has 16 years experience in the creation of Management Committees as participation organs for AP's management. • There are 9 co-administration experiences (with NGOs, indigenous organizations, academic institutions, etc.). Nevertheless, participation demands have not yet been fulfilled. • Management and mobilization of indigenous peoples (2006) led to the definition of a new work agenda between organizations and SERNAP. Co-management or shared responsibility territorial management have been proposed as a new approach and public management model. This means practicing direct social participation, with actual capacity to make decisions, beyond consulting, information or validation. It means sharing decisions and responsibilities. For the aforementioned, a new organizational structure has been established for the general council of territorial management with shared responsibility, which has been operating in 12 PAs.	**National park and indigenous territory Isiboro Sécure.**  Isiboro – securé indigenous territory is recognized as a protected areas and an indigenous territory. Indigenous peoples inhabiting it are autonomous, they decide in agreement with the State, they have the power to interact with organizations from other territories and they share the management of the park with the Bolivian State. They think they have common interests: protecting NR, protecting the integrity of the territory and preventing benefits for families. "This territory is understood by indigenous as the space for political-social exercise where life reproduction takes place". Several co-management modalities have been presented, which have gradually been strengthened: • In 1996 the first co-administration agreement is signed for the execution of a project • In 1997 the second co-administration agreement is signed between MDSMA – DNCB and the sub central (5 years). It starts the management of natural resources, territory guards and life plan. • Third agreement, 2002 2007. Five years. Indigenous director of SERNAP, PML, CACAO • Fourth agreement 2007 - 2017. Shared Management between Sub central and SERNAP Legitimacy and trust have increased given the promotion of dialogue; there is a large co-responsibility to safeguard the territory and the players (states - community) jointly evaluate the work of park directors. Sustainable use of Natural Resources and benefits are aimed at communities.. Communities have organized themselves with SERNAP to defend the territory against pressures from colonization.

Country	General national context of APs' governance	Specific experience of governance situations
Brazil	From a legal point of view, the Brazilian State recognizes Conservation Units as protected areas assigned to the maintenance of biological diversity and genetic resources, to the protection of landscapes and natural characteristics, to the promotion of sustainable development from natural resources, education, research and ecologic tourism, among others. They are created from studies and they are organized from the Management Plan. *Indigenous lands* and *quilombolas territories*, are not legally recognized as protected areas, but their contribution to the conservation of biological conservation and physical, cultural and social survival of these populations is noticeable	**Monte Roraima National Park – indigenous land Raposa Serra do Sol**   Created in 1989 in accordance with Decree N. 97,887 of the 28th June. 90.000 ha. Inhabited by ingarikó indigenous communities. It is a very isolated population. The purpose of this project was the valuation and rescue of this indigenous culture. The government has developed a series of actions in conjunction with indigenous communities (ingarikó), among which, the following ones are worth mentioning: • 1996. IBAMA starts working on the recognition of the Park in conjunction with ingarikó; in 2000 the PM formulated in 1990 was approved, financed with environmental compensation funds from the Guri Electric Transmission Line. • in 2000, FUNAI publishes in the ingarikó language a report on the results of studies and the exchange of information titled "PNMR Kaané! (não" em kapon, ingarikó language)". This document is disseminated at the national level. • As of 2003, the National Foundation of the Indigenous - FUNAI - and the Brazilian Institute of the Environment and Renewable Natural Resources - IBAMA, participate in general meetings and both have deciding capabilities. • As of 2006, the Monte Roraima National Park is a public asset, submitted to the double affectation regime: Preservation of the environment and the execution of the indigenous› constitutional rights. It is managed jointly by FUNAI and IBAMA and the ingarikó indigenous community. These instances submit for approval to the Ministries of Justice and Environment, a joint administration plan. • This is how advancements have been made in a joint management process which has been gradually strengthened through training processes on subjects related to: ethno-environmental planning, management plan, ethnic development, etc.

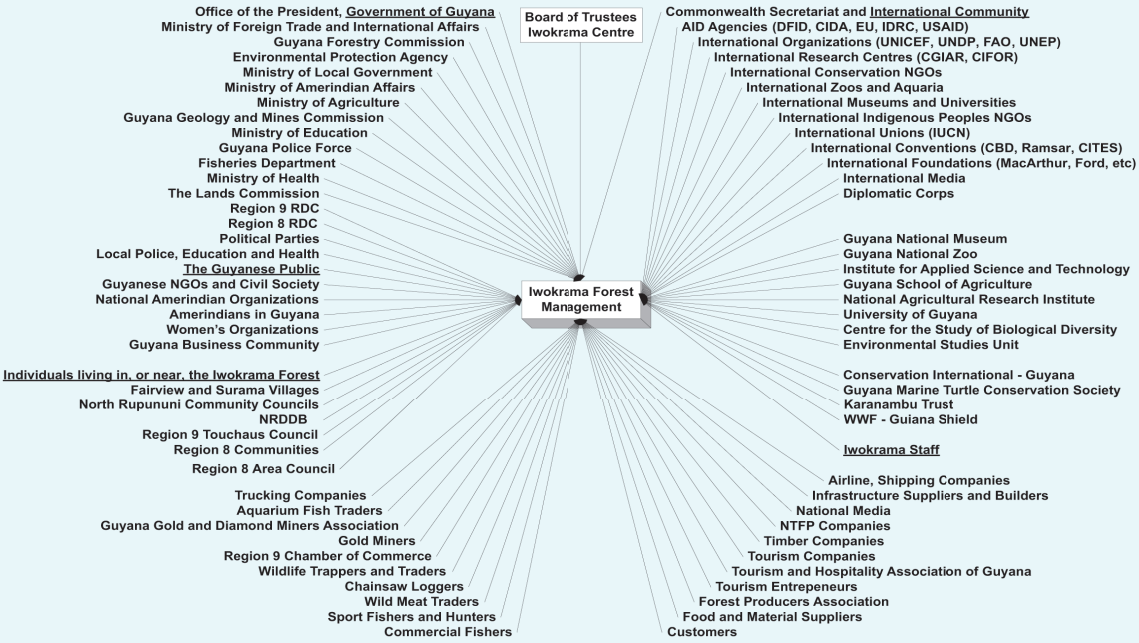
Country	Specific experience of governance situations
Colombia	**Process of the declaration of a protected areas of the National Natural Parks System in the Yaigoje Reserve – Apaporis** Changes in 10 years   **Background:** • 1990. This area is considered a priority for biological conservation • 1993. Parks Unit UAESPNN, makes a proposal to declare a national natural park in an area of 320.000 ha. Finally, the indigenous reserve Yaigoje – Apaporis is extended. • 2008. The indigenous organization ACIYA requests from the Ministry the creation of a park in the reserve in order to strengthen integral protection and conservation of the territory • The same year in June, an agreement between ACIYA and UAESPNN is signed to protect biological and cultural diversity, to sustainably preserve and to manage its goods and services and to guarantee its ecologic integrity, its representation and biogeographic connectivity, as well as to protect material and immaterial goods of the Macuna, Tanimuka, Letuama, Cabiyari, Barazano, Yujup Maku and Yauna people. • The proposal for the creation of the Natural National Park was submitted to a Prior Consultation process, coordinated with ACIYA, UASPNN and the Ministry of the Interior, carried out through a socialization visit along the 19 ACIYA communities and a consultation protocolization process with the community of Centro Providencia - Yaigoje Reserve - Apaporis. **Current pressures over the protected areas and the reserve** • Unsustainable mining exploitation • Unsustainable exploitation of natural resources and rudimentary exploitation of gold in lakes, streams, torrents and beaches • Advancement of illegal crops from the colonization areas towards the low basin of the Apaporis river. • Settlement of large mining projects on forest reserve areas and indigenous territories. Advancements are being made on a pilot experience of incentives for the conservation and environmental governance in an area of 4 million ha. in the jurisdiction of the Association of Traditional Indigenous Authorities ACAIPI, ACIYA, ACIMA and PANI. This process is carried out with the state, traditional indigenous authorities, base social organizations, civil society and productive sectors.

Country	Specific experience of governance situations
Ecuador	Participation of the COFAN community in managing protected areas **Cofán Culture.** Language is A'ingae or cofan; anciently they live on the banks of San Miguel, Aguarico and Putumayo rivers; with an approximate population of 1400 cofan speakers. Their main sources of food are plantain and yucca; they also live on hunting and fishing; their main clothe is the undiccuje; their main economic activity is conservation: eco-tourism, handcrafts, guides or motorists. FEINCE is the organization which represents the COFANE in respect of the government and the society, but there are also CONAIE, CONFENIAE. **Governance at the Cofán Bermejo Ecologic Reserve.** There is an agreement between the Ministry of the Environment and FEINCE, which establishes that FEINCE is in charge of the administration of the reserve. To appoint the area chief, FEINCE puts forward a Cofan list of three candidates for selection The management plan is made at the local level, under cultural criteria The area›s financing and budget is competency of the Ministry of the Environment, given this reserve is part of the SNAP Training of human resources is carried out by FEINCE, as well as control an surveillance (Park Rangers) Park Rangers› mission is "to strengthen control and surveillance of reserves, respecting ancient customs of existing settlements, as well as the Ministry›s current requirements.  Cofán Bermejo Ecologic Reserve. Declared in 2002. (55.000 ha.) **COFÁN program's challenges:** To create awareness among local, national and international public opinion of the importance of protecting the reserves with local players (indigenous – peasants and others); to create long term financing (Trust fund) which allows the program working with future generations; to train young COFANs to continue ongoing activities. **Main achievements in the area's co-management:** More than 50% of the Cofán population works in the conservation of the area; 430.000 ha. of tropical forests are protected by the Cofán; FEINCE, strengthened as political organization; interest shown by other indigenous communities in this co-management model for conservation.

Country	Specific experience of governance situations
French Guiana	**Kaw-Roura national natural reserve and local communities Marie-Rose GOBER (representatives of the Kaw village)** Created in 1998. It has an area of 94,700 ha. It protects two types of ecosystems: Flood savannas and forest ecosystems. In 1989 it was declared national protection biotope zone. In 1992 it was catalogued as RAMSAR wetland. In 1996 a massacre of black caiman took place and in 1997 hunting was prohibited. The reserve was created in 1998. The place has been catalogued as a hotspot with a high index of endemism. Initially, people did not agree with the creation of the reserve due to the following: i) there was no prior consulting, ii) ancient practices were limited (hunting, fishing, felling and burning) as well as the access to traditional places, iii) there was no cooperation between the reserve›s personnel and people from the village. To date, there is a participative management, translated into a better cooperation between the local community and the reserve›s administration. The management plan for this protected area, which is being produced jointly, will end in December 2010. Also, local community and touristic operators meet periodically to make decisions.  In the future, the reserve›s management is expected to be in charge of the local community, authorizing them to protect it and to value it for this area to be a real tool for local sustainable development.

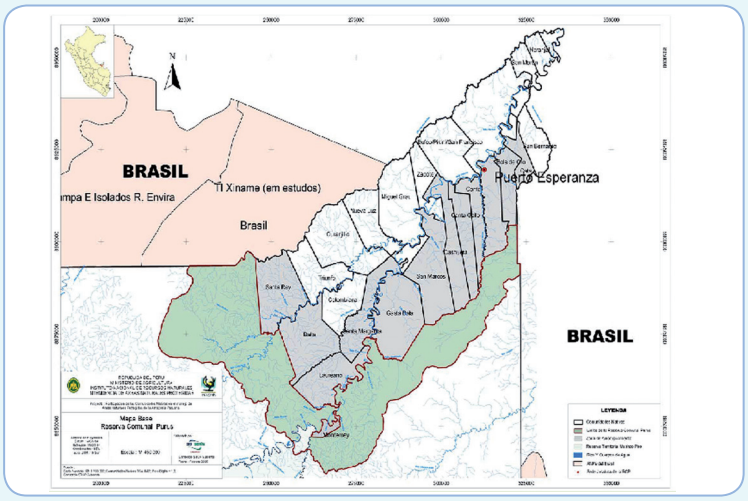
Country	Specific experience of governance situations
Guiana	**Iwokrama conservation center: Community participation in forest management** Iwokrama is a sustainable development experiment established by Guiana in cooperation with the Commonwealth in 1996. It is an international autonomous research and training center for the dissemination of technologies, as well as a world class national development center. It has 371,000 ha. of tropical forest. The Iwokrama forest and its research center provide a place to prove the concept of a truly sustainable forest where conservation, environmental balance and economic use are compatible. The mission of this space is to promote conservation and sustainable and equitable use of tropical forests to obtain long term ecologic, economic and social results for the local population and for the world. The first phase of the Iwokrama research was focused on the collection of baseline information for the forest›s planning and zoning. Local communities participated in the selection of the zones, which were based on two criteria: Natural reserve zones and sustainable use areas. During this phase, several bioprospection, forest use, wetlands, social research and marketing projects were carried out. The current phase emphasizes the development of businesses (basic costs) in areas of eco-tourism, training, sustainable forest use, intellectual property and services.

Iwokrama: players involved



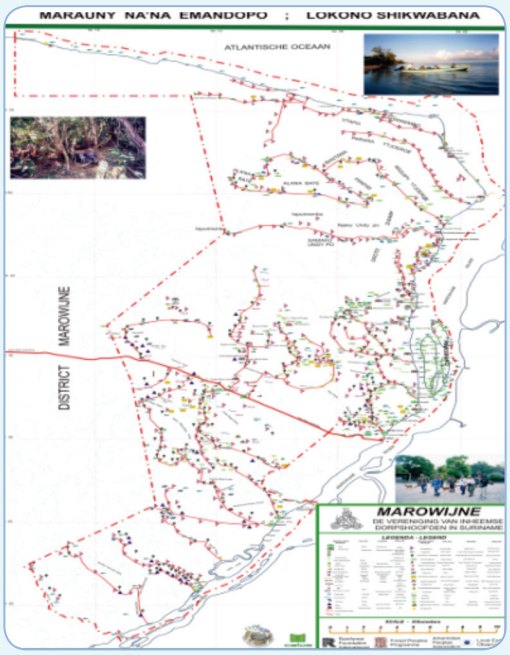
There is a unique alliance in Iwokrama (see graph): 18 local communities (approx.6.000 people of whom 90% are indigenous. About 60% of Iwokrama›s personnel come from the Rupununi communities) which are stakeholders and participate in the operations of sustainable agencies in wood, tourism and research and they share benefits through co-management of forests and benefit distribution agreements; scientists in charge of the research and a wide range of businesses managed in a sustainable manner to obtain income from the forest and from its natural assets. Organizations and communities work in conjunction with the Government of Guiana and other international partners, including the British company Canopy Capital, in the development of a new approach for countries with tropical forests to obtain important income for the services of the ecosystem and the practice of a creative conservation. This alliance pretends to prove that a tropical forest may be used and protected in a sustainable way and in the benefit of local communities.

This is an innovating model of governance and business development which includes the private sector and the local community through participation agreements; a single form of decentralized government (stipulated in the Parliament Law) in the hands of a Board of International Trustees, in which indigenous representatives may also participate. This way, relationships are created, based on equity and mutual trust, which help the unit of the Iwokrama congestion and its multiple resources.

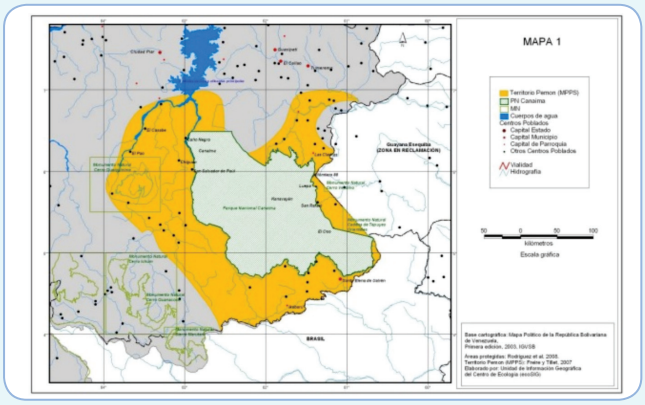
Country	General national context of APs' governance	Specific experience of governance situations
Peru	40 of the 67 PAs are in the Amazon Region (19%). One of the PAs categories in Peru are the **community reserves**. They have a direct use category, assigned to the conservation of wild flora and fauna, pursuant to benefiting local population and communities of peasants or nearby native communities. There is a special regime to regulate the administration and participative management between the State, peasant or native communities and organized populations. Administration has been designated to SERNANP, represented by the reserve chief and by an executor - non for profit legal person created by the beneficiaries to represent them. An assembly and its Board of Directors are also established. This team has, among others, the following responsibilities: To produce the master plan and the annual operational plan, to administer economic resources assigned; to promote training of stakeholders; to develop community surveillance in coordination with the Reserve Chief.	**Conservation of Mahogany in the Buffer Zone of the Purús Community Reserve**  The Purús Community Reserve (population, 202.000) is located in the province of Purús which constitutes the buffer zone for the Alto Purús National Park. 80% of the population in Purús is indigenous and 20% is mixed race. There are 8 indigenous peoples, some of them in voluntary isolation. Indigenous peoples as the cashinahuas, sharanahuas, yines, chaninahuas and amahuacas work on agriculture, hunting, fishing, collection and handicrafts as main subsistence activities. ECOPURUS is a local indigenous organization recognized by the Peruvian State with a currently valid administration contract for the co-management with the reserve›s leadership. In this reserve, communication of administrators with the population is carried out through the indigenous mother tongue, in order to maintain their inhabitants› cultural identity. This entity organizes participative community workshops, it makes visits to communities to inform and promote conservation of Natural Resources and to strengthen surveillance committees. A direct threat to biological diversity and to the integrity of the reserve›s natural wealth and nearby zones is wood extraction, especially mahogany. Therefore, within the Natural Resources conservation program, the design and application of guidelines and regulations to regulate the use of flora and fauna have been managed with local communities, through the application of management plans approved by the reserve›s leadership. This way, extraction of "mahogany" Swietenia macrophylla and "cedar" Cedrela odorata has been banned and training processes have been developed for the production of mahogany seeds. Also, reproductive management of water turtles is being developed with the participation of eight (8) indigenous communities.

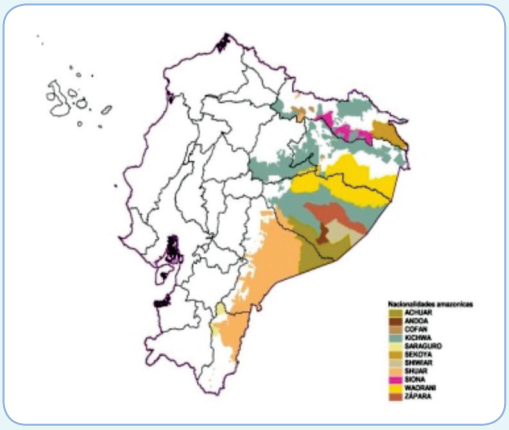
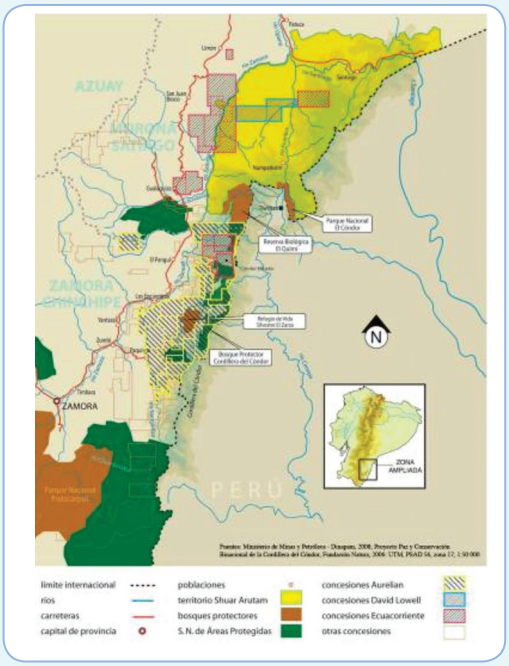
Country	Specific experience of governance situations
Suriname	**Protected area and the community of Galibí. Conservation experience of local and indigenous communities** Galibi is an indigenous village located to the West, on the banks of the Marowijne River. Its main source of income is fishing (70%), followed by eco-tourism (20%), based on the conservation of marine turtles. Different conservation activities are carried out in this area in conjunction with communities: eco-tourism, beach cleaning projects, environmental education, research, etc. The area is administered by the community council of the village, a board of directors and three area coordinators: marine turtles, eco-tourism and environment. The purpose of these players is the development of educational and economic activities and projects in a cooperative atmosphere tending to the conservation and sustainable use of bio-diversity. The protected area was created without the consent of the indigenous community. Nevertheless, in 1992, another process is established aimed at obtaining an effective participation of the community in decision making, management and planning of the PA. Currently, this area has a better organization, community has a greater awareness of the importance of conservation of bio-diversity, as well as of services provided by their resources.

Country	Specific experience of governance situations
Suriname	The process has had several positive effects: there is a better institutional and community organization in Galibí and in the low Marowijne zone; there is a long term vision to manage the indigenous territory through the development of a territorial organization plan based on traditional use and occupation; there is the need to adopt a new legislation which recognizes the rights of indigenous people to administer and manage traditional territories through a participative and transparent process, gathering good experiences from currently protected areas. The protected area has regional recognition and governmental and NGOs' support; additionally, several experiences have been replicated beyond said territorial space; institutionalism has been strengthened and there is a cooperative work between PAs officers and the village council. Even though, there are certain issues to be overcome: • Insufficient guarding of local parks • Few workers for follow up and monitoring activities • Poor funding to promote tourism in Galibí • Lack of road blocks, which makes it difficult to control illegal movement of marine turtle eggs.



Country	Specific experience of governance situations
Venezuela	**Life plan of the Pemón people** **People's vision: "WAKÜPE/WAKÜ:PE KOWANNÖ-TOK,** or the best way to live". For this people, full conservation of their territory is crucial, as a guarantee for the permanence of the Pemón people. The territory is the space to develop and maintain cultural representations. Nevertheless, they consider that the appropriate adoption of new technologies is a new inter-cultural venue in which they should live. They consider sacred places as signs that land owners exist, they are symbolic representations which specify the use of resources. But this is intimately connected to their regulations and restrictions which lead them to an articulated vision between man, as an element immersed in indivisible nature and the concept of earth which leads them to nature, as a whole. This is why violation of sacred places and contamination of sacred waters may cause illnesses or even death. The life plan pretends to strengthen living within principles and values as people and as a Pemón community and to be major figures of decisions in their own life, as well as to build a public management proposal from inter-cultural perspective ("interculturality"). Pemon people establish the following demands in their own lives, each one of these demands is developed through programs and projects. • **Demarcation and Titling of lands and habitats.** It is developed through three programs: Conservation and traditional sustainable use; traditional and scientific knowledge; organization of indigenous territories and habitats. • **Management and use of resources.** • **Education.** Program: strengthening of bilingual intercultural education. • **Health.** Program: Revaluation and use of traditional medicine from an intercultural perspective. • **Economic Development.** Program: productive projects; training and financial and technical assistance. • **Organizational Strengthening.** Programs: policies and alliances; training, supplies and equipment.



Organization	Specific experience of governance situations
COICA	**COICA:** The purpose of the Coordinator of Indigenous Organizations of the Amazon Basin is "to define policies, to produce proposals and actions at the local, national and international level to promote, to defend and to exert the rights of indigenous peoples through the coordination, dialogue and agreement with public and private players and international cooperation". This organizations is against the creation of new protected areas in indigenous territories; it demands active participation of indigenous peoples in the PAs Systems established, for the parties to: NGOs, private companies and other players apply prior, free and informed consulting to obtain agreement and regarding PAs which have been declared on indigenous territories and lands, they request restitution and/ or repair of processes (Article 28 of the UN Declaration and resolutions from the 5th Congress of Parks, Durban, 2003).  COICA highlights the following situations of governance in the Amazon Region: • A´i Cofan (Cofán Bermejo Ecological Reserve) case. • Achuar Case (territorial constitution) • Shuar Case (CTSHA - GTSHA) • Sarayaku Case – Kichwa (autonomy). **Case: Shuar Arutam People - Shuar territory, of trans-border interest** Communities have organized into the Inter-provincial Federation of Shuar Centers - FICSH. Located in the Cóndor Mountain range (11 thousand Km²). It is a labyrinth of hills with altitudes ranging from 300 - 2900 masl. There are around 200.000 ha. with 60 communities, population: 8000. (1000 families). Depend on forests in 40 - 80% Shuar leaders have been promoting since 1998 the right to organize their territory and to create their own government. In 2004, the trans-border interest territory Shuar Arutam is created with a local autonomous indigenous government.  The Shuar Arutam people have worked on their own mechanisms for the defense of their territory, culture, government and in the protection of natural resources. They built their life plan in a participative manner: conservation of forests, agriculture, management of natural resources, development of health, education and culture systems. It created common law rules (for example. for the solution of conflicts over land, sustainable forest management rules, hunting, fishing, etc.) and it created a Management and Territorial Organization Plan: Strict conservation zone, low usage conservation zone, sustainable forest usage zone, sustainable usage zone. Leaders produced a hunting, fishing and recollection rule, accepted by 80% of the communities. They have a fund (FONDESHA) which has made investment projects and plans for the conservation and development of the Shuar Arutam people. These funds are assigned as follows: 40% family insurance; 15% health; 15% education; 15% productive micro-credit; 5% scholarships; 5% forest management and 5% for administration.

Source: proceedings workshop "Conservation experiences with indigenous and local communities in protected areas in the Amazon Region. Georgetown, April 19-20, 2010

Skills and training needs

To leverage an effective governance of protected areas, it is convenient to generate not only technical capabilities, but also organizational, political and communicative, as well as management and social agreement capabilities and capabilities for inter-cultural, inter-disciplinary and inter-institutional management. The aforementioned at the different decision making scales or levels: governmental, regional and local officers, civil society and other social players involved in managing protected areas.

Even though countries in the region have advanced in training processes especially aimed at local officers, the need to generate continuous training processes, with a wider scope and with all instances and players related with the management of protected areas is evident. The following are among subjects demanding a greater learning: social control processes, leadership generation, human rights, administration of PAs (co-management), decentralization, citizens participation, conflict resolution, governance and intercultural dialogue (millenary knowledge). Nevertheless, it is appropriate to go deeper into the training requirements and needs for a better governance of PAs, given there is no specific information available.

Element 3.
Best practices

FINANCIAL SUSTAINABILITY
For the conservation and management of Protected Areas in the Amazon region[46]

A crucial element for the stability and governance of systems in protected areas is the ***"financial sustainability"*** which refers to the capability of a country to assume costs associated with the management of the system of protected areas. This implies, on the one hand, "offer" of funds, that is to say, the generation of stable financing means and sources, timely and long term income, and on the other hand, the challenge of the "demand", that is to say appropriate and efficient administration of resources available for the management of PAs (at the level of individual PAs and of the system). Therefore, financial sustainability of PAs requires considering both sides of the financial equation (Bovarnick Andrew, 2008). In that sense, appropriate financial sustainability is affected by a set of legal, political and institutional elements and factors, as well as factors related with management and governmental budget planning.El Bioma

46. Information presented in this section configures a preliminary configuration of the financial sustainability of PAs at a regional scale. It should be strengthened within the framework of the consolidation of the construction process of the eco-systemic view of the conservation of the bio-diversity of the Amazon Biome.

Amazónico enThe Amazon Biome faces important threats and anthropic pressures. These affect directly in a higher complexity and therefore in higher management costs. Sustainability and integrity of the Amazon Region will depend mostly on good management and on effective conservation of protected areas comprising it. It has been stated that this is possibly the main conservation strategy in the log term. Despite the aforementioned, a series of regional reports and evaluations[47], have identified financial sustainability as one of the three main barriers in consolidating and developing the conservation of protected areas. Regarding this subject, the following challenges have been identified as priorities in the Amazon Region:

- Low priority of protected areas in terms of positioning within political agendas regarding national development plans.
- Low capacity to manage and to implement new financing sources and financial sustainability mechanisms.
- Inappropriate administrative and financial systems to disclose information and to promote incentives for the generation of new resources.
- Lack of legal, institutional and political conditions necessary to facilitate implementation of new financing mechanisms.

In the region, there has been an economic growth in the last decade due to the use of its natural capital and it has been especially stressed that protected areas play a crucial role in the economic and social development of the countries in the Amazon Region, which has allowed for, among others, identification and declaration of new protected areas, consolidation of legal and institutional frameworks as well as a leap in the site management and administration approach towards the conformation and strengthening of national conservation systems.

Consequently, the search for sustainability of national systems of protected areas, more than looking for an increase in available resources for management and conservation, is strictly linked to the sustainability of the economic model valid in the region. This recognizes that from the multiple dimensions of profitability, investment in national systems of protected areas becomes a vital strategy for the development and the growth of the set of countries in the Amazon Region.

Some differentiating elements detailing with more specificity protected areas from the Amazon Biome and which contribute to the concept of financial sustainability at a regional scale are:

- Protected Amazon areas cover large surfaces, which favors economies of scale.
- They are not as attended as other protected areas within national systems, except for Brazil which expresses that conservation of protected areas within this Biome receive more priority than others in the rest of the country.
- They are isolated and they are difficult to access, demanding higher operational costs in connection to traveling and logistics.
- In general, they implement a limited number of management programs and they focus more in control and on surveillance.
- They provide environmental services whose beneficiaries are beyond their sphere of influence, becoming pub-

47. First Latin American Congress of protected areas in Santa Marta in 1997 to the Second Congress in Bariloche in 2007.

lic goods which generate services at a global scale.

- They are articulated to logics of appropriation and exploitation of natural resources where players are easily identified.
- They are closely connected to indigenous territories and not contacted peoples.
- They are usually the only state presence in isolated zones and they receive demands exceeding their actual attention capacity.
- They face serious threats which exceed the capacity and direct control of environmental authorities (illegal crops, illegal traffic of species, armed conflicts, oil and mining activities).

Analysis of the general financial situation of the system of protected areas in the Amazon Biome

The analysis of the financial situation of protected areas in the group of countries in the Amazon Region is made via a score card for financial sustainability developed by UNDP. Its purpose is to support project teams and governments to follow up for PAs systems to be financially sustainable. The scorecard has been designed for PAs systems and not for individual PAs. It has been structured in three parts: a)General Situation of the PA system including basic information on PAs and a financial analysis of PAs National System; b) Evaluation of the Elements of the Financing System and c) Advancement score and measure (Bovarnick, *et al.,* 2008).

In accordance with Bovarnik (2008) the general *financial situation* of the system provides a quantitative analysis of the PA system and it shows the financial data required by PAs' planners. The evaluation of *the elements of the financing system* provides a qualitative perspective and shows the legal, political and institutional frameworks affecting the APs' financing systems, business planning and other tools for the cost-effective management and schemes as well as systems for the generation and flow of income.

Financial situation and financial analysis of AP systems[48]

Quantitative factors

Countries that constitute the Amazon Biome have a combined GDP of 2,45 trillion dollars. Together they would be the seventh larger economy in the world. These countries grew in 2008 an average of 5% (Table 27). Brazil is the largest economy in this region, constituting practically 70% of the combined GDP.

48. Information presented in this document is a first baseline general approximation and financial projection based on estimates to be validated and adjusted within a specific regional exercise.

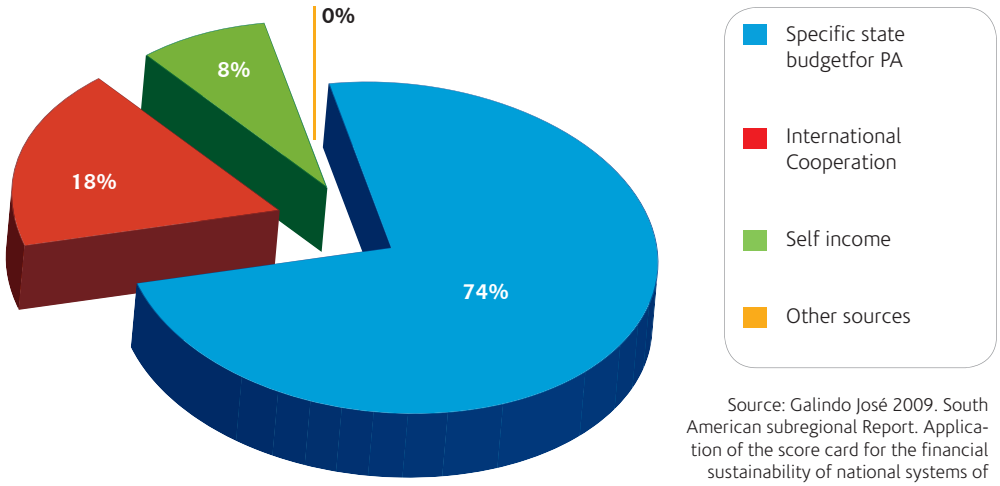
Table 27. Economic indicators and populations in the Amazon Basin countries

Countries	GDP	State Budget		No. Inhabitants	Increase GDP (%)
		Income	Expenditures		
Bolivia	18.940.000.000	8.044.000.000	7.341.000.000	9.247.816	5,6
Brazil	1.665.000.000.000	411.255.000.000	426.240.000.000	198.739.269	5,2
Colombia	249.800.000.000	76.420.000.000	78.490.000.000	45.013.672	3,5
Ecuador	54.670.000.000	19.440.000.000	17.790.000.000	13.927.650	5,9
Guiana	1.130.000.000	488.700.000	552.600.000	772.298	3
French Guiana	€ 3.000.000.000	€ 892.600.000	€ 115.600.000	202.000	4,1
Peru	131.400.000.000	38.830.000.000	35.500.000.000	29.180.900	9,2
Suriname	2.984.000.000	392.600.000	425.900.000	481.267	6
Venezuela	331.800.000.000	106.200.000.000	100.800.000.000	26.414.816	4,9

Source: PNUD 2008. Human Development Report. IEDOM, INSEE, AFD – 2007 (French Guiana).

The total annual budget available to cover the costs of management and conservation of the national PA systems analyzed, amounts to two hundred million dollars to over 150 million and about 1,500 hectares of conservation units in the nine countries which share the Amazon region. The total amount presented includes the total direct costs and indirect costs at the site level and national coordination, donor resources, other government offices and extra resources.

The state is the main source of income for PA's in the region with a share of about 74%, followed by international cooperation. Self - management revenues represent less than 10% of the resources available and they are mostly generated by way of the entrance fee to the AP (Graph 5).



Source: Galindo José 2009. South American subregional Report. Application of the score card for the financial sustainability of national systems of protected areas. UNDP - TNC.

Graph 5. Percentage share of income by source

This indicates that it is essential to work in a diversified portfolio of sources of income for conservation, to ensure long-term resources and not overly dependent on unstable sources. It is also important to pay attention to government sources, particularly during the post crisis period where there may be greater pressure to reduce public expenditure.

There is no consolidated information which allows us to observe the economic contribution of Amazonian Biome to the GDP for each country, nor economic valuation exercises at the biome scale showing the profits generated by the Amazon PA's for different economic sectors. However, some countries have made progress in studies analyzing the contribution of protected areas to the national economy. Peru, according to reports[49], the PA system would contribute to the national economy in about 10 billion dollars over ten years. The MMA from Brazil is developing a study to determine the contribution of protected areas in the country for national and local economy, based on the analysis of goods and services generated by the existence of conservation units in all Brazilian regions and biomes. Preliminary results of this study will be presented at COP 10 in Nagoya.

Table 28 shows some data on the financial situation of the Amazon region's PAs in six Amazon countries[50] .There is evidence that the resources allocated to biome vary between 20% and 100% of the total resources available for the entire national PA system in each country.

Based on this information, it is estimated that the total resources available to the PA's of the Amazon Biome in the year 2009 are within a range that varies between USD 75 million and USD 100 million. The above means that around 20% to 48% of the total resources available for national PA systems of the Amazon countries are thus covered. When analyzing an indicator such as cost per hectare, the amount actually invested in the PA's of the Amazon Biome is significantly lower than the amount currently invested in other biomes. There are a number of reasons to explain this behavior: the relative size of conservation units, isolation, reduced exposure to cer-

Table 28. Total resources available for the Amazon Region PA's by country in 2009

Country	Total resources available for Amazon AP ($)	Percentage in relation to total resources available for the entire national system of AP (%)
Bolivia	2.093.770	38
Brazil*	44.540.858	20
Colombia	6.049.878	30
Ecuador	1.176.143	30
French Guiana	9.820.000	100%
Peru	10.758.410	72

Source: regional workshop reports from Sao Paulo - Brazil, 3 to 6 February 2010; regional office of the environment of French Guiana (DIREN), 2010 (only in national parks and nature reserves).
Information provided by countries in regional workshop in Lima, Peru, August / 2010.
* Federal sources and international cooperation resources, excluding resources in the Amazon states.

49. "The contribution of natural protected areas to the national economy" - Fernando León Morales, 2007.
50. There is no similar financial information for the Amazon region PA's from Guiana, Suriname and Venezuela.

tain anthropogenic pressures and operating characteristics of the vast Amazonian territories.

As for the financial gap, it is noteworthy that Amazon countries are undertaking exercises based on a methodology to facilitate comparison and monitoring. In a first exploration, performed within the context of the process of building an ecosystem vision, with the software - Projection System for Minimum Investment for Conservation (IMC – from its Spanish initials - *Sistema de Proyección de Inversiones Mínimas para la Conservación*), developed by Brazil[51], it was estimated the about USD $ 200 million has been invested in the consolidation of Protected Areas in the Amazon region. This investment includes expenditure on infrastructure, equipment, management plans, inter alia. Nonetheless, there is a gap in investment of about USD 500 million for all of these protected areas to reach minimum levels of management effectiveness. It was also estimated that the annual demand to cover the recurrent costs of the protected areas of the biome, after the minimum investments made to cover the financial gap mentioned above, will be approximately $ 250 million. Currently, the joint annual budgets of the Amazon countries are close to 40% of this value.

Elements of the financing system. Qualitative factors

The analysis of the financial situation from the perspective of a qualitative study of the behavior includes the following components and elements (Bovarnik 2008):

- **Component 1. Legal, regulatory and institutional framework;** it evaluates the legal, political and institutional frameworks, which must be clearly defined. The aforementioned components must also support effective financial planning and income generation as well as revenue retention and management. Institutional responsibilities must be clearly defined and concerted and there must be a backup policy and legal framework established. Institutional governance structures must enable and require the use of effective and transparent mechanisms for allocation, management and accounting of revenues and expenses.
- **Component 2. Business planning and tools for cost-effective management.** Evaluate effective financial planning which requires accurate knowledge not only on income but also on expenditure levels, patterns and requirements. The options to balance the cost / income ratio must be given equal importance to those of revenue growth and cost control.
- **Component 3. Tools to generate income.** PA systems must be able to attract and benefit all existing and potential income mechanisms, within the context of their overall management priorities. This component assesses the sources of income for PA systems which may include traditional funding sources - such as entry fees for visitors – as well as innovative ones - such as debt swaps, tourism concession agreements, payments for ecosystem services (water and carbon) and, in some

51. IMC is a product generated by a working group of financial sustainability developed and coordinated by the MMA, which had the support of the ICMBio, TNC, CI-Brasil and Brazilian Biodiversity Fund (Funbio).Available on the website of the MMA - Brazil.

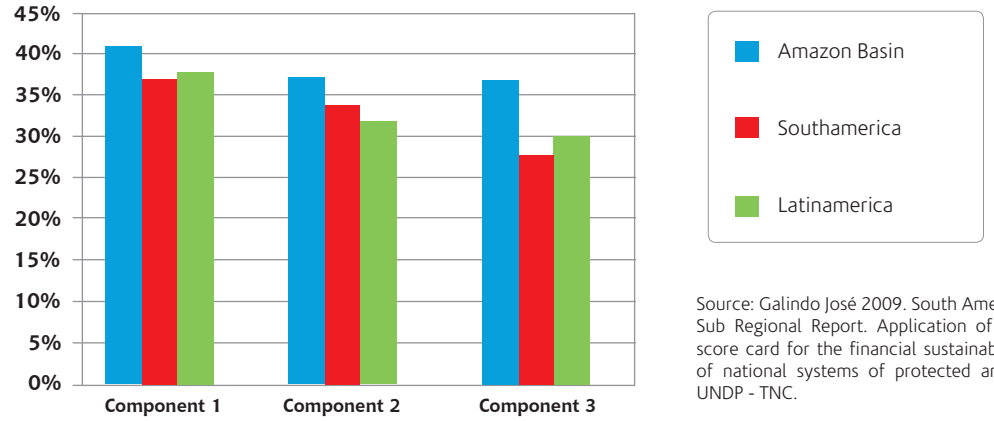
cases, carefully controlled levels of resource extraction.

The evaluation of the elements of each component of the financing system for the Amazon Biome region shows no significant differences between scores at the national PA system with those obtained at the specific level of the PA's which are part of the Biome. The overall performance of countries in terms of three structural elements analyzed is slightly higher than the South American and Latin American average (Graph 6).

Tables 29, 30 and 31 show the percentage performance achieved by each country in the Amazon biome, for each of the elements discussed in each component. According to the score achieved by each country, three groups can be evidenced: the first group situates Colombia as the leader in Latin America with a ranking above 50% performance, a second group formed by Bolivia, Ecuador, Peru and Venezuela with a range between 33% and 42%; and a third group, showing Brazil with a score of 26%[52].

The lowest scores (highlighted in red) suggest areas of emphasis to focalize technical assistance and cooperation resources which would have high resulting impact. The countries consider that the main challenges and institutional, instrumental and capacity barriers for financial sustainability are fundamentally national, therefore they go beyond the control and scope of influence of PA managers and other officials at the site level.

Overall, in relation to Component One, there were no significant differences in regards to the legal, institutional and instrumental framework in effect at the level of national PA systems in every country and in relation to the Amazon region's PA's. Regarding economic assessment, states agree on the need to undertake systematic economic assessment processes which reflect the contribution of PA's in the Biome to development, especially regarding its



Source: Galindo José 2009. South America Sub Regional Report. Application of the score card for the financial sustainability of national systems of protected areas. UNDP - TNC.

Graph 6. Comparative performance of the basin in terms of the qualitative elements of the Scorecard

52. It is important to note that the score sheet has a highly subjective nature and thus its analyses depend on the vision of the evaluator and the baseline assessment. As a consequence, it is necessary to make progress towards the use of tools with a lower degree of subjectivity.

role in terms of poverty reduction. Likewise, and since the Biome generates goods and services of a global sort, it is quintessential to quantify their contribution so as to have a technical basis which enables for the design of compensation and mitigation schemes.

With respect to Component Two - aspects related to business planning – such aspects are affected mainly by the lack of updated management plans. In relation to Component Three - availability of schemes (tools) for generating income - the focus is more on ensuring implementation of existing tools.

Table 29. Score obtained by the Amazonian countries for component 1 as % of total possible

Component 1: Legal, regulatory and institutional framework	Bolivia	Brazil	Colombia	Ecuador	Peru	Venezuela	Pan Amazon Average	Latin America Average
E1 - Legal, policy and regulatory framework for revenue generation per PA.	17	33	50	33	33	17	31	39
E2 - Legal, policy and regulatory framework for the distribution and retention of revenues within the PA system.	78	44	22	11	56	33	41	35
E3 - Legal and regulatory conditions for the establishment of funds (charities, sinking funds or revolving funds).	56	0	56	78	44	56	48	37
E4 - Legal, policy and regulatory framework for alternative institutional arrangements for PA management to reduce the cost burden to the government.	8	67	58	42	50	50	46	54
E5 - national strategies and financing policies AP.	46	17	69	54	31	38	43	31
E6 - Economic valuation of protected area systems (ecosystem services, from tourism jobs, etc.).	17	0	33	50	17	17	22	25
E7 - Improved government budgeting for the PA system.	50	33	75	42	25	8	39	39
E8 - clearly defined institutional responsibilities for managing and financing AP.	67	100	33	33	67	67	61	57
E9 - The staffing requirements, profiles and incentives are well defined at the individual AP and the system.	61	33	56	44	17	33	41	35
Total Component 1 (% of maximum possible)	**44**	**36**	**50**	**43**	**38**	**35**	**41**	**38**

Table 30. Scores obtained by the Amazonian countries for component 2 as% of total possible

Component 2: Business Planning and tools for cost-effective management	Bolivia	Brazil	Colombia	Ecuador	Peru	Venezuela	Pan average	Average Latin America
E1 - Business Planning at the level of individual AP.	22	44	78	44	33	11	39	28
E2 - accounting and auditing systems operational, transparent and practical.	67	33	67	44	44	33	48	45
E3 - Systems for monitoring and reporting on financial management performance.	42	25	67	25	25	50	39	28
E4 - Methods for allocating funds to individual AP.	100	0	100	0	0	50	42	45
E5 - training and support networks to enable PA managers to operate in a cost-effective.	39	0	56	28	17	28	28	22
Total Component 2	**54**	**20**	**74**	**28**	**24**	**34**	**39**	**32**

Table 31. Scores obtained by the Amazonian countries for component 3 as% of total possible

Component 3: Tools for income generation	Bolivia	Brazil	Colombia	Ecuador	Peru	Venezuela	Pan-average	Average Latin America
E1 - Number and variety of revenue sources used in the PA system	58	50	58	58	67	33	54	41
E2 - Development of user fees of the PA system	20	20	47	40	33	13	29	34
E3 - effective systems of fee collection	33	25	83	42	50	50	47	40
E4 - marketing and communication strategies for revenue generation mechanisms	17	0	33	33	0	0	14	15
E5 - Mechanisms of payments for ecosystem services (PES) in operation for AP	33	0	42	50	42	17	31	18
E6 - AP concessions operating within	0	25	75	8	67	58	39	27
E7 - Training programs for income - generating means	33	33	33	33	33	33	33	24
Total Component 3	**28**	**22**	**53**	**38**	**42**	**29**	**35**	**30**

On the other hand, Table 32 shows some of the comments and contributions to the Amazon countries outlined in the regional workshop on financial sustainability after the implementation of the score sheet at the national level.

Table 32. Relevant aspects that contribute to characterize the financial situation of the Amazonian countries' PA's

Country	Comments
Bolivia	It has approximately 200,000 people living in protected areas, mostly superimposed on indigenous territories.
	In a baseline scenario, it estimates a cost per hectare for the Amazonian protected areas and approximately USD 0.18 USD 0.40 cents in an ideal scenario.
	Identified on the score sheet a major weakness in terms of tools for income generation and strength as to the possibility of retaining the revenue generated.
	One problem is that self – management income pays taxes, which impacts the amount of available income and increases transaction costs.
	It does not identify sufficient legal tools and incentives to improve the existing financial situation except for the tourist track.
	Identifies a weakness in the link between information systems and decision making.
	Business planning for AP generates resistance as they are identified as neo-liberal tools.
	It has prioritized participation models in the benefits generated by conservation schemes based on shared management.
	He attempted a specific form for the Amazon, but found no major difference with national results.
Brazil	Amazonian PA's have 10 years of continuous growth in number and in size, but only marginally increased the amount of resources available for management.
	The PA federal system is managed as a budget; there is a possibility to be more flexible in budgeting to reflect the priorities of the Amazon PA's.
	It has the ARPA program, which is committed to working in PA's and to supporting their basic development. In seeking to consolidate the second phase, there is a double purpose in terms of financing targets which have been proposed, $ 120 million for investments and a trust fund of $ 140 million.
	90% of the available budget covers usual expenditure. The main gap is the staff, with approximately 2,000 people, but a number of about 9,000 is required.
	The first priority for the country is to strengthen existing means through legal figures. They particularly seek to regulate the articles of the law on the land market.
	The lowest point in Brazil is the number, variety and scope of the tools and funding mechanisms.
	International financing mechanisms currently available are not supported at the Amazon level.
	The environmental services of the Amazon Biome transcend the regional level, therefore global participation is to be sought.
	It mentions its priority of addressing the economic valuation exercises on indicators and specific models of local development.
	There is a proposal to increase national intelligence for financial planning, which involves developing a financial strategy and reference material published in Portuguese.
	It suggests a careful attitude when handling the results of the exercise of defining needs and the results are usually far superior to the existing resources, falling in the risk of being seen as unrealistic.
	Shows concern for the low perceived benefit of the AP by Brazilian society.

Country	Comments
Colombia	Maintains a policy of solidarity and subsidiarity for the entire national PA system.
	In the allocation of resources to PA's a yearly expenditure plan based on the findings regarding management plans or strategic plans. These plans do not include transportation.
	PA chiefs coordinate expenditure and define their priorities. They have the ability and they are empowered to leverage resources from other sources.
	Return on investment in PA's is not being currently assessed, since it is not known whether the investments yielded the expected performance.
	There is a systematic process in planning and cost control, which allows timely adjustments and reallocations. The system rewards good performers with spending additional resources to its management.
	In the last year there has been a significant increase in state resources. This was achieved with the active support from donors and via the use of information on costs / ha from neighboring trading strategy to argue the issue politically.
	The main weakness identified in the score sheet refers to the legal, regulatory and institutional aspects. However the third component is prioritized which is related to schemes for income generation, as the latter depends 100% on the institution, while the former depends on other factors beyond their control.
	The lowest score obtained in the score sheet refers to the legal and regulatory framework; however, it does not consider that this element is necessarily the highest priority for the country.
	It seeks unified models and methodologies for calculating funding needs.
Ecuador	Has substantially increased the amount of resources available for the national PA system in recent years.
	Has a specific budget to improve business approach (plans, tourism, and infrastructure) in PA's. Responds to an approach which considers that PA's should not be of strict conservation but also sustainable use.
	It has recently adopted a ministerial agreement to reinvest in PA's, They recognizes that 50% of self-management resources should be directly reinvested in the AP that generated them.
	Better expected legal and enabling capacity this year, based on the life of the GEF Project financial sustainability of the National Protected Area System (SNAP – from its Spanish initials – Sistema Nacional de Áreas Protegidas).
	It has been refocused towards a model of sustainable use, demanding greater capacity to generate business and productivity of the PA's.
	Expected to increase participation in the benefits generated by the PA's through business plans with the communities.
	Is in the process of incorporating the environmental dimension in national accounts, with a specific initiative led by the Ministry of Environment called Green GDP.
Guiana	There is no national PA system as yet. Two PA's have been declared in the Amazon border; each PA has its own laws and independent management systems.
	The Government is committed to allocate 10% of national territory as protected areas.
	A mechanism to which they have resorted in order to generate income in one of the PA's in the country is sustainable timber harvesting. PA communities own 51% of the shares of the logging company.
	International funding is not consistent. Great enthusiasm in funding was initially shown in one of the PA's, but over time this international support waned. The government funded the necessary resources for the PA to continue functioning properly due in part to a request from the affected communities.
	For one of the PA's, the initiative of getting communities involved in decision-making and management, there has been a significant impact in supporting these communities for the PA's, and consequently in reducing management costs.
	A project consisting of payment for forestry services has been undertaken under a scheme of REDD +, especially for carbon storage. The project has been managed directly by the President and has finalized a commitment on the part of Norway for $ 250 million over a defined period of time.
French Guiana	The government is the main source of income for the PA's. A methodology was developed to define the financial requirements for each National Nature Reserve (criteria of area and local context: isolation, scientific work and ecotourism) and now it is used for the annual allocation of each subject (collectively, over 15% between 2008 and 2010).

Country	Comments
Perú	The NPA's finance their activities with resources from payments or fees in exchange for using resources, tourism fees, payments for environmental services, with equitable distribution of costs and benefits, government budget and attracting external funding, through grants, contracts, agreements, grants, resources collected directly, bequests, franchises, special funds, debt swaps, imposed for infringements in the field of NPA's, etc.
	The priorities of the country which are included in the Master Plan of the national PA System abide by the priorities analyzed from the implementation of the score card.
	A new institutional framework for environmental management and planning has just been created, and starting this year, it has significantly increased the state budget for conservation.
	The budget has been maintained, but the source has changed, ordinary budget goes up, on the one hand, and international cooperation decreases, on the other hand. Self - management resources but have not changed significantly, though.
	Regional governments have access to additional sources as royalties in some cases are exploited to fund PA's.
	There is an economic valuation exercise of the national PA system, which has made it easy for the authorities to start taking PA's more seriously.
	Congress supports the SERNANP with tax breaks to certain areas such as the acquisition of means of transport.
	Local population benefits from the use of biodiversity through business plans. This allows lower costs because people are committed to improving control and surveillance.

Source: Memoirs from the Regional workshop held in Sao Paulo - Brazil, from the 3rd to the 6th of February, 2010 in the context of construction of an Ecosystem Based Vision of Biodiversity Conservation for the Amazon Biome; regional office of the environment of French Guiana (DIREN), 2010.

Overall, the political nuances between countries in the region are clearly reflected in certain mechanisms and financial sustainability tools such as environmental funds, figures of participation and co-management, payment for environmental services and mechanisms akin to climate change. This fact motivates the thought of an inclusive process which is proposed for identification of new forms of conservation and innovative financing mechanisms which may respond to the current conditions and the technical and financial needs of the Amazon Biome.

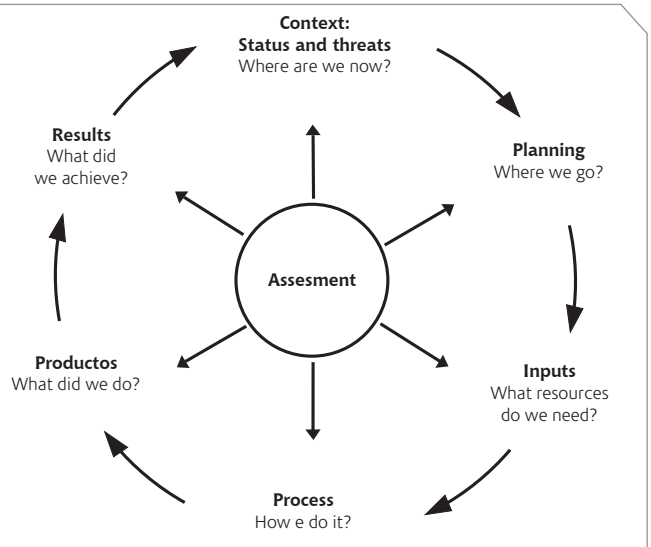
The financial reality of the PA's in the region poses the challenge of managing scarcity, therefore the quality of expenditure is quintessential. In this regard, a greater integration with existing processes and initiatives of PA management effectiveness is expected. Also, the lack of plans is a major barrier to generate cost - effective management; since there are no technical guidelines, there is a risk of carrying out investments which do not meet priority needs.

Large infrastructure projects have been identified as a major threat to the integrity of the Biome. This implies the need for additional resources to strengthen the capacity of authorities in controlling and monitoring compliance with prevention, mitigation, compensation and remediation measures, from business sector activities of high impact.

MANAGEMENT EFFECTIVENESS OF PROTECTED AREAS

While substantial progress has been made in creating various figures of conservation, it is appropriate to assess the operation and the management given to these areas so as to develop strategies and measures which ensure its sustainability over time and thus the preservation of the subjects they protect. The development and / or adaptation of methods and instruments aimed at assessing the effectiveness of management (MEA) of protected areas thus become ever more important.

Amazonian countries have developed, adapted and implemented several tools for monitoring and assessing effectiveness in managing protected areas. Much of these have been based on the Framework of the World Commission on Protected Areas (WCPA) of IUCN, which proposes to consider six so – called "moments" in an analysis of effectiveness: context, planning, supplies, processes, products and outcomes (Figure 6). These moments are framed in some questions that lead to a basic outline of evaluation:



Source: Workshop memoirs "Effective management of Amazonian protected areas.25 to 27 September 2009"

FIGURE 6. **Reference Framework for Adaptive Management IUCN**

- **Background:** status of the area, conservation values, threats and opportunities which affect it and the current political environment.
- **Planning:** includes assessment of the national legislation of the PA's and other policies, as well as PA system plans. Systems are subject to analysis in order to determine whether they are omitted or over - represented for some types of habitat and the scale of the area. Evaluation focuses on suitability.
- **Supplies:** this moment measures capacities in term of human resources, financial resources and infrastructure. The focus of the evaluation lies on economic issues.
- **Process:** the focus of evaluation is efficiency, that is to say the adequacy of the processes and management systems in relation to the management system for a system or a site. Questions currently are aimed at assessing whether there are standards or agreements on how to manage the PA.
- **Products:** The focus of evaluation lies on effectiveness, that is to say what has been achieved with the management performed. The extent to which goals, work programs and plans have been implemented is also assessed herein.
- **Results:** This moment evaluates whether management has been suc-

cessful with respect to the objectives of the management plan or plans; it includes long-term monitoring. The focus of evaluation lies on effectiveness and suitability.

As shown in Table 33, Colombia, Brazil, Bolivia, Peru, Ecuador and French Guiana have analyzed management effectiveness of protected areas on a regular basis, using tools which have been reviewed and tested within the context of the country. On the other hand, Venezuela has implemented pilot assessment and staff training events. As for Guiana and Suriname, despite the fact that they have effective tools on management (Butterfly-G), they have not initiated any assessment tasks to date.

Although significant efforts have been made in developing processes and tools for Management Effectiveness Assessment (MEA) in the region, in most countries there is no internal system to consistently apply the tools and processes regarding Management Effectiveness Assessment (MEA).

Overall, the Management Effectiveness Assessment (MEA) – related tasks performed do not address all the moments suggested by IUCN - WCPA. The context is perhaps the most thoroughly worked moment, followed by planning and supplies. By contrast, the products and results are the least addressed moments by the tools applied in the Amazon. This emphasis varies according to the measurement goals and the context of the assessment. The fact that not all items are considered may be due especially to difficulty and little experience (both at regional and international level) in the creation and implementation of metrics to help understand these elements and / or the high cost of gathering information in measuring, as well as limitations on funding and on institutional and operational capacity. Thus, it is noteworthy to state that some areas have been assessed by more than one agent and with different tools, which demonstrates the need for strengthening institutions and governance in the management, monitoring and evaluation of PA systems. Additionally, PA authorities of each country should define an official tool to conduct Management Effectiveness Assessment (MEA), ensuring thereby continuity over time. In any case, it is agreed that any assessment – related task intended to support adaptive management shall seek to emphasize on all elements of the framework of reference.

The evaluation tasks developed have contributed to the updating and collection of baseline information of the protected areas and to highlight threats in values such as place, weaknesses in management and, in some countries wherein management plans have already been drawn, these assessments help update and adjust those already existing plans and to establish a continuous process of monitoring and assessment of management. Furthermore, in some areas it is managers and administrators of the PA who continuously carry out this task, whereby the region has gained experience and therefore technical capacity, management capacity and feedback.

Several of the tools based their measurements and levels on the area's objectives (which are reflected in management plans or they are implicit in the informal management; that is to say, no management plan). However, the vision of the area is incorporated in a few tools, since many sites do not have short and long – term objectives, nor do they have vision designed. Likewise does this phenomenon apply at the level of protected area systems (Cracco *et al* 2006).

Table 33. Tools used by the Amazonian countries for monitoring and assessing management effectiveness of protected areas

Country	Tools used	Data obtained	Actions implemented after evaluation	Observations
Bolivia	2000 - 2006 Measurement of MEMS management effectiveness (based on the scorecard of TNC 2000)	Context and management Systematic information	Improvement of Planning Tools Equipment, Staffing	The MEMS tool is developed on the basis of indicators and sub-indicators, which are weighted with a scorecard established according to a range. Indicators and ranges describing each of them refer to the existence and functioning of the various tools of management in protected areas of Bolivia›s National Protected Area System (SNAP -from its Spanish initials – *Sistema Nacional de Áreas Protegidas*). The score ranges from level 1 – poor to level 5 as the optimum level, determining percentage ranges for each parameter. The tool in Bolivia lacked a clear strategic framework, and Failed to address operational aspects of the system and the impacts of management. Useful for individual analysis of PA's Indicators have been gradually improved and supplemented to provide more objective measurement instrument. The methodology makes part of the axis of management of protected areas and management effectiveness, within the SERNAP comprehensive monitoring system. Nevertheless it is not conceived as a mechanism for adaptation and improvement of management. In practice, the methodology cannot assess progress toward a stated goal, therefore not helpful to evaluate the "effectiveness" Inexpensive deployment.
	2003 - 2006 comprehensive monitoring system of protected areas (SIMAP). (Designed by Monjeau 2004)	Contextual and management – related issues were identified: conservation priority objectives, impact-generating activities and management priorities	Implementation of concrete actions (NR management projects, increased control) 9 programs were developed for each PA monitoring	System supported on five pillars of monitoring: environmental threats to biodiversity, management, socioeconomic management, and conflicts. Aimed at generating information necessary to identify: i) sites with high conservation value, ii) factors affecting the conservation, iii) development of performance management and planning, iv) participation of local stakeholders in the management and revenue generation and v) social conflicts over use of natural resources. It is an integral tool since it allows evaluating PAS's, but of a high technical complexity, which hinders its operation, even worse if there is no technical and financial capacity, or institutional will. Systems of this nature should be framed in strategic planning processes at the level of PAS. Methodologically, it presents some gaps such as data collection, criteria and indicators to assess and lack of coordination and interaction patterns among the five pillars.
	2004/2005: RAPPAM-WWF			RAPPAM consists of a questionnaire by way of statement with four options: "yes," "mostly yes", "mostly" or "no." This format can help detect trends rather than describe the precise extent of the scope of different topics.
	2007-2009: Systemic Analysis	Context and management: impacts - effective management	Resource management SEA the way Villa Tunari - San Ignacio in TIPNIS	A - systemic analysis (no model), but based on priorities and emergencies. It involved a multi - time analysis of hedging and investment vs. deforestation.

Country	Tools used	Data obtained	Actions implemented after evaluation	Observations
Brasil	RAPPA (2005 – 2006)	Analysis: Context, ii) effectiveness of management and iii) system of conservation units Systematic diagnosis of UC's federal system.	Supported decision making Allowed to provide support for the prioritization of actions, the definition of programs and to establish a continuous process of monitoring and evaluation of management.	The following indicators were used as a basis for assessment in the analysis: biological significance, economic importance and vulnerability. Management effectiveness was evaluated through the following indicators: *Planning* (goal of the UC, legal protection and design and planning of the area) *inputs, processes* (planning, management, decision making, research, evaluation and monitoring). Results (threat prevention, wildlife management, restoration of areas, monitoring). As a product of the evaluation, it was found that 13% of the AC have a high effectiveness in management, 36% had a medium – level effectiveness and 51% had low management effectiveness. The evaluation study also allowed evidence of common problems in the conservation units, that is to say illegal activities, major threats, pressures and impacts, as well as causes and gaps in the administration and management of UC. The assessment survey measures to some degree the effectiveness of system - scale management.
	Tracking Tool (2005 y 2006)			It is a tool for monitoring the effectiveness of management known as a monitoring tool. It was applied in order to monitor progress in investment in protected areas of the Amazon region of Brazil. The evaluation questions were organized according to five elements: context, planning, supplies, processes and products. As a result, evolution in the average effective management was shown, which rose from 37% to 43% from one year to another.
	FAUC/ARPA (Since 2006)			Assessment Tool Storage Units.
	PGR/ARPA (Since 2006)			The Result Management Program – (PGR – from its Spanish initials *Programa de Gestión de Resultados*) is based on the Model of Excellence in Public Administration (*Modelo de Excelencia en la Gestión Pública*), National Public Administration, GESPÚBLICA and the Ministry of Planning of Brazil. It is based on 8 criteria of excellence: leadership, strategies and plans; society, citizens, information and knowledge, personnel management, management of processes and outcomes. This initiative is designed to implement management practices which support the consolidation of protected areas, with the optimization of financial, human and material investment, focusing on follow-up performance and continuous learning. It presents some advantages over other tools because it measures critical factors for the establishment of a minimum capacity of management, such as leadership and organizational climate. As progress was made in self management of conservation areas, using as reference the model, scores were rising, since it had joint efforts on improving management practices which were found to be weak in the earlier reviews. This methodology has, as one of its strengths, the fact that it produces an overall result that summarizes the performance management of conservation areas. This facilitates comparison of results between UCS and developing solutions to improve the yield of UCS.

Country	Tools used	Data obtained	Actions implemented after evaluation	Observations
Colombia	AEMAPPS (It has been applied in 2004, 2006 and 2009)	**Effectiveness in the short term** achievement of objectives and goals achieved and quality of process performance and resource use. **Short and medium term efficiency:** the level of governance in the AP; potential of quality management and management plan.	Priority was given to the development of policy guidelines, conceptual and methodological bases of management strategies to reduce the pressures and effects in search of fulfilling the objectives of conservation areas.	AEMAPPS: analysis of management effectiveness of protected areas with social participation (AEMAPS – from its Spanish Language initials - *Análisis de efectividad del manejo de Áreas Protegidas con participación social*). It is divided into three periods long, medium and short term. It measures effectiveness based on two units of analysis and complementary indices: efficacy (achievement of objectives and goals) and efficiency (quality performance of processes), which are based on indicators to measure the temporal change in management status. Each indicator includes a number of variables to be measured from different situations corresponding to the current situation in the area. There is also a variable percentage of the indicator. That is, each variable and indicator has different weight compared to other variables and indicators. The application of the methodology contributes to: i) adaptive management areas, ii) prioritizing the use of resources for enforcement of the institutional mission, iii) generating in the Protected Area teams the culture of regular self management vi) creating awareness among decision makers of the three levels (national, regional and local) on the importance of using the results in decision making v) answering questions with updated information management vi) prioritizing strategic national management to provide technical support to teams; vi) being consistent with international commitments on the issue of protected areas in the II and IV World Parks Congress held in Bali in 1982 and Venezuela in 1993 and vii) developing the framework proposed by the World Commission on Protected Areas (WCPA). Its strengths include: i) incorporating variables of social and armed conflict; ii) differentiation between effectiveness and efficiency with the percentage weightings of each variable to generate a result in advancement rates; iii) prioritization of weaknesses and strengths management in terms of indicators; iv) temporality characteristics (measurement of effectiveness in the short, medium and long term) which are revisited in the strategic plans from management plans. It covers the six elements of the Framework of the WCPA v) measures processes that lead to site consolidation and storage capacity in a given project area; vi) easy to customize. Its main gap lies in the fact that it is not designed to measure the direct impact on the conservation of biodiversity. Some of the specific products derived from effective exercises are: i) Management plans set; ii) strategic plan of the institution with programs that incorporate strategic priority management, iii) guidelines for Declaration of buffer zones, watershed management and restoration; iv) strategies for monitoring and research; v) baseline that allows tracking for international cooperation projects; vi) Materials for the construction of effective tools for system - level PA's in regional areas (public and private).

Country	Tools used	Data obtained	Actions implemented after evaluation	Observations
French Guiana	General inspection of the environment on natural sites ("sites inscrits") (2005).	Assessment of the status of each "site inscrit" and proposals to strengthen the network of sites.	Project "site class" for Abattis-Cottica (expected in 2010) Study for the realignment of the "Vidal" site Discussions with some communities to create new sites.	
	General inspection of the environment on the management of nature reserves (2007).	- Weaknesses in the management of nature reserves, at the administrative level and level of management agencies. - Proposals to improve the situation.	- Change management agencies. - Establishment of a unique scientific committee for all nature reserves. - Funding growth of nature reserves.	The new management agreements for each nature reserve are signed for 3 years now. The Convention includes the obligation of the management agency to develop a management plan before the end of the period of 3 years.
	External evaluation of the management of each National Nature Reserve (2010).			This assessment takes place during May and August 2010.
	Conservation assessment in the area of biotope "Sables blancs of Mana" (2010).	Evolution of land use and conservation status and proposals for the future.		The objective is to assess the PA, the extent of illegal use area by the population and establish a strategy to curb the impact on the protected area.
	General inspection of the environment on national park management 2009.	- Diagnose the global level (governance, internal organization and relations with Partners). - Proposals to improve the management.		
	Study for the realignment of the "Vidal" site 2009.	Strengths and weaknesses of the site Proposed new, reduced definition, but with enhanced status (Classified site).	A development project planned in this area to the future classified site.	This study is needed because the site is suburban, was impacted by urban development and is still threatened by development projects.

Country	Tools used	Data obtained	Actions implemented after evaluation	Observations
Ecuador	De Faria (1993).	Evaluation of the implementation and effectiveness of park management plan Galapagos. Efficiency in the management of Pas was assessed in other PA's from Ecuador.	Updating the park management plan freshwater.	It is a process that comprises two assessment areas: aspects of planning and legal. Has been applied and improved on several occasions and in various protected areas of Ecuador. Galapagos Park has been a hotbed of various experiences of evaluation of effectiveness and with different tools. This methodology also evaluated the efficiency of managing 24 natural areas.
	Cifuentes, et. al.(2000)	Early assessment in the Sangay Park.		Measuring the effectiveness of Protected Area Management. WWF, GTZ, IUCN, Turrialba, Costa Rica. This tool, like others, offers a comprehensive evaluation process where the core team and stakeholders are first selected, then primary and secondary data are collected, and finally selected indicators, variables, and their location subvariables areas to be sorted. This method is based on the one developed by De Faria (1993).
	MAE-GEF I (1997)			Efficiency Assessment of Sangay National Park Management. Management Plan.
	Valarezo, *et. al.* (1999)			Efficiency Assessment of Management of Protected Areas SNAP.
	NATURA (2002)			Efficiency Assessment of Sangay National Park Management.
	Hockings, M., Stolton, M., Dudley, N. (2000)			Framework for evaluating management effectiveness. IUCN.: Enhancing Our Heritage Project: Sangay National Park
	BM – WWF (2003)			How to report on progress in the management of individual protected areas. This tool is based on the implementation of the Framework of the WCPA (5 first elements). Serves as a report on progress in management effectiveness of protected areas or of several similar areas (with limitations on the equivalence of results between different areas) and should not be considered as the only source of information for management adaptable It does not perform a thorough evaluation of the impact of PA management The tool is particularly focused on assessments of forest Protected Areas.
	TNC. ECOCIENCIA (2004)			Consolidation Sites (SCORECARD) in the areas of the Condor Bioreserve. This method is based on the theoretical concept of functional protected area or «established» that can persist indefinitely. For this to happen, four «building standards of an area or site» are proposed: i) activities in situ minimum protection, (ii) whether long-term management, (iii) financial sustainability for the minimum handling of the site and (iv) support for the site or area by the local community. The assessment scores measure the progress towards the consolidation of a site, but it does not measure progress on reducing direct threats or direct impact on conservation.
	Valarezo, V. (2004)			Indicators for Monitoring and Evaluation of Management of NPA's in Ecuador.

Country	Tools used	Data obtained	Actions implemented after evaluation	Observations
Peru	Indirect monitoring Grade Bd Conservation (1996 - 1997).			Matrix developed by Pedro Vasquez, Data Center for Conservation at the request of USAID. Was applied to a sample of 14 NPA's. Based on six areas of management including 12 variables. The areas were: legal aspects, administration, planning, knowledge of the area, use of natural resources and threats.
	Conditions Monitoring required for the administration of ANP (2001).			A sample average was applied to 30 PNA's until 2006. The matrix was based on the methodology proposed by De Faria (1993). The matrix looks at three areas: administrative, legal / institutional and management of the area. All areas have the same weight and include 10 variables and 26 sub-variables: description of a situation expected to verification tools.
	Condition monitoring update (2007).			Was updated for the reason that many ANP advanced in their management and some indicators were out of date.
	Monitoring effective management of AP (2007 - 2009).	Technical, Administrative and financial results of ANP Baseline for each indicator matrix Weaknesses in the management of NPA.	Update master plans and management plans ANP. Development and adjustment of POA's. .	This matrix incorporates the recommendations of the WCPA, regarding the fact that each country must have tools for monitoring and evaluation of the management cycle of ANP (IUCN). Also, based on existing methodologies.
	Semaphore management (1990).			It was used in the nineties to assess the status of the areas according to key management indicators.
Venezuela	Enhancing our heritage	Threats of site values Bibliographic Database Site maps Priority areas.		It contains measures and assessment tools that are organized according to the six elements or steps of the framework of the IUCN WCPA. It is flexible and can adapt to the differences in each of the sites which are carried out. The toolbox of Enhancing Our Heritage includes adaptations of previously developed tools for a variety of institutions.

Sources: Cracco et al 2006, General diagnostic analysis of the effectiveness of environmental management and monitoring of PA systems in the Amazon region (February 2010), reports of workshops: i) Effectiveness of Amazonian protected areas management.25 to 27 September, 2009 ii) Common indicators for assessing management effectiveness in protected areas of the Cordillera Real and the middle eastern Putumayo. 25 - 27 Nov 2009, regional office of the environment, French Guiana, 2010.

There is still little experience in assessing and measuring impacts or outcomes of protected areas in conservation and ecological integrity at regional and global, which makes it in turn difficult to develop a clear link between MEA and the general planning of protected areas and therefore management and adaptive management. In addition, there is a dichotomy between research, planning and evaluation.

In terms of institutionalization[53] of the tools and MEA processes of protected areas, in some countries of the region a certain process of *institutionalization* is occurring, but not necessarily for *processes or the subject of* MEA. For example, the AEMAPPS tool is being institutionalized in Colombia, but it remains unclear to what extent the MEA process is being institutionalized in bodies with competence and

53. It is understood as the process of PA's MEA being sustainable and routine – like within an institution.

interest in the subject and the country in general. On the other hand, there is no tool or process institutionalized in the PA agencies in Peru; however, the issue of MEA does appear in the Master Plan for PA's for the country. In general, in many Amazonian countries there is an intention to institutionalize certain tools and in general the process at national level (Cracco *et al*. 2006).

The fact that MEA has not yet been institutionalized could partly be explained by the relative youth of the subject, since progress has been made in a stage focused on research for conceptual aspects rather than the application of assessment processes. This relative youth is also reflected in a general weakness of public agencies which manage PA's in information management and the development of specific skills for the MEA. This in turn is linked to poor investments in the PA's and the agencies in charge of management, derived mainly from public budgeting. Another explanation may be the existence of "stardom" regarding development and application of methods or tools and the pressure to incorporate one method or another and, as an additional factor, the lack of a change in organizational culture. Achieving a change in the mindset towards the MEA and planning processes in general is not easy (Cracco et al 2006). In this regard, it is important to find ways to institutionalize (formalize) the MEA process as part of the planning and management of Protected Area Systems. MEA is seen as an element additional to management, and not part of it; thus, it is not useful in the planning process in short, medium and long term.

At ***regional level,*** has not, as yet, found any tool which evaluates different PA systems. Whereas to some degree RAPPAM measures the effectiveness of management at the system level up to a certain extent, at the regional level efforts are still made in trying to develop a tool to perform a more comprehensive assessment[54] mainly because of the difficulty of having an objective methodology to conduct assessments at this level and because the effectiveness of the system as a whole is not necessarily the sum of the effectiveness of PA sites or individuals that constitute it.

In this regard, in the context of building conservation vision of the Amazon biome, spaces have been created in order to advance a common methodological framework for assessing management effectiveness of the surrounding areas, based on the experiences that developed countries and international instruments have proposed for this purpose. The establishment of a system of permanent exchange of experiences and information is being encouraged, as well as a regional proposal for the integration of analysis of effectiveness of management in Protected Areas.

There is sufficient experience and capabilities in the region so as to deploy, maintain and support effectiveness assessment tasks in protected area management, with common frameworks. The opportunity of the program of work for the Amazonian Biome must be exploited so as to build south - south cooperation initiatives. Additionally, it must also be ensured that Venezuela, Guiana, Suriname and French Guiana, make progress in their assessments and progress in institutionalizing them.

54. TNC is currently leading this initiative.

Thus, it is necessary to standardize tools and methods of MEA, as there is already a global indicator of management effectiveness and any tools which may result useful to the regional context can also be jointly select and / or adapted to different contexts. Thus, each country can adapt a method with a minimum level of indicators / measures (reporting) that are common to all countries which will advance the evaluation. In addition, the application of MEA processes and tools must be developed in a coordinated (in time), full - scale and systematic manner.

For purposes of achieving a common framework for assessing management effectiveness of different systems and adjacent protected areas, it is recommended that countries continue leveraging the learning process, exchanging and analyzing MEA results, the strengths and weaknesses in management, adopting best practices and concepts, information and systematization of such.

On the other hand, other sectors are to be involved, as well as other levels of government and society involved in the implementation of the MEA, so as to achieve consensus in MEA and so as to facilitate the incorporation of results, not only in planning and management protected area systems, but other plans, programs and policies of state. This could also be an option to leveraging financial resources so as to promote the sustainability of the objects and systems of protected areas.

It is also important to give greater emphasis to the implementation and use of results of the MEA process, as well as the institutionalization of the process, rather than mere development of tools. Additionally, the processes of MEA should be linked to planning in general and for adjacent areas, starting with management plans for three time horizons i.e. short, medium and long term, and develop greater expertise in the measurement of ecological integrity in the Protected Areas.

The work of international NGOs is particularly noteworthy in research, development and implementation of tools and methods of MEA; this experience must continue to be strengthened in a coordinated and in a cooperated manner, along with the authorities of protected areas in the Amazonian states in such a way that it allows similarity of processes and tools and it enables the institutionalization of regional – level MEA processes.

Finally, regional – level MEA processes should further consider other issues which are gaining interest such as *certification of Protected Areas* and, of course, the *evaluation of corridors*. As for certification, the efforts are still meager. Ecuador, to name one example, has designed a quality system based on ISO 9001:2000 in the National Park and Galapagos Marine Reserve. Padovan *et al.* (2001) validated, in Central America, a system for certification in three Protected Areas (Costa Rica, Honduras and Guatemala) and conclude that it is possible to use a generic standard for certification of various categories of protected areas, which may perhaps be applied at worldwide levels. Nonetheless, in some scenarios, subject experts show concern about the costs and benefits of the creation and use of a certification system of protected areas and models for it.

Regarding the *Assessment of Corridors* in the Amazons, albeit there were no evaluations at this level in the Amazonian region, a general tool for biological corridors is known to exist, which has been developed and implemented in Costa Rica.

This is considered a standard approach that can be adapted to different contexts. It includes limitations and tool improvements required to be made in other territorial areas. For example, it explains that indicators should be included which allow for monitoring processes of co-operation, co-management and adaptive management in relation to the objectives of the biological corridor. It also suggests including a glossary of terms so as to standardize the interpretation (Cracco *et al.*, 2006).

Although there is no record that this methodology has been applied in the region, the presence, development and implementation of corridors in the Amazon makes it mandatory for the aforementioned methodology to be more closely looked at, so as to understand the potential for its application. A comparative analysis of the same with the Framework of the WCPA may be performed, as well as a comparative analysis with the principles of the ecosystem approach (ibid. pg. 47).

Chapter 3

The Amazon biome: synthesis and challenges

in the Program of Work on Protected Areas and in the Ecosystem Based Vision of Biodiversity Conservation for the Amazon

The previous chapter recounts the major advances in developing the workplan for building the vision of the Amazon Biome ecosystem conservation and hence on the elements of the Program of Work on Protected Areas (PWPA). It also sheds light on a number of restrictions or limitations of technical, political - administrative, operational and financial sort which must be overcome in order to achieve a regional system of protected areas ecologically representative and effectively managed in the Amazon Biome which may help reduce the loss of biodiversity, mitigate climate change and in general contribute to sustainable regional development, based on their natural and cultural potential.

In this regard, the main regional progress in meeting the objectives and goals of PWPA are summarized in the following sections, thereby proposing a set of strategic actions and activities in the **short** (1-4 years), **medium** (5-7 years) and **long term** (8-10 years),

which are projected for execution in order to strengthen the process of Ecosystem Based Vision of Biodiversity Conservation for the Amazon Biome. They also seek to achieve thus the effective implementation of the Program of Work on Protected Areas. The actions outlined are the result of the analysis and conclusions made by the technical specialists in systems of protected areas and other players who participated in regional workshops organized in the framework of building the vision. The projected action plan was supplemented by professionals who are members of the editorial committee and who supported the design of this report. In addition, the Directors of the systems of protected areas in the Amazonian states clarified and agreed on the strategic actions, their activities, as well as the deadlines of this which is to become the regional workplan to develop on a ten-year horizon.

Summary of progress and challengesin the process of ecosystem vision of Conservation of the Amazon Biome

Undoubtedly one of the most significant achievements at regional level in implementing the PWPA, is the creation of the inter-agency network coordinated by REDPARQUES and supported by the World Wildlife Fund (WWF), the International Union for Conservation of Nature (IUCN), the Secretariat of the Convention on Biological Diversity (CBD), with the participation of the Amazon Cooperation Treaty Organization (ACTO) and the Andean Community of Nations (CAN).

The inter-agency network is advancing in constructing the **Ecosystem Vision of Conservation** for abovementioned geographical area, executing the agenda that was defined and supported by systems of protected areas of the countries that share the Amazon and that considers PWPA goals and objectives, this being an opportunity to integrate regional conservation work in a single process.

This work began two years ago. A large group of players and national and international entities have joined in, with whom important cooperation agreements are currently being worked on. The initiative has gathered a range of products, which can include the following: i) the establishment of task forces for the various topics discussed, formed by professionals of the systems of protected areas of the Amazonian countries; ii) systematized information on the situation of each country regarding defined topics, iii) the presentation of actions to take in order to achieve the consolidation of the regional process according to the topics addressed, and iv) a report which consolidates the progress of the region in implementing the PWPA and the construction of the Ecosystem Based Vision of Biodiversity Conservation for the Amazon Biome.

It is vital to further strengthen this initiative for the conservation and development of this rich and strategic territorial space. Consequently, the Inter-Agency network has set a ***goal and a set of actions*** which shall facilitate its management and which shall result in effective management of regional biodiversity conservation and cultural areas, as well as contribute to

the maintenance of a comprehensive and functional Amazonia that is also resistant to impact and natural and anthropogenic pressures.

In order to further this process, the principles and guidelines of the **ecosystem approach** (EA), adopted by the Parties to the Convention on Biological Diversity (CBD) at the fifth meeting (COP-5 - V6) (Annex 1) are taken as conceptual and methodological framework. EA is defined as a strategy for integrated management and restoration of land, water and living resources that promotes conservation and sustainable use in an equitable, participatory and decentralized manner, and that integrates social, economic, ecological and cultural aspects in a geographic area defined by environmental limits[55] (UNEP / CBD / COP 6, 2000).

Goal and Actions to strengthen the process of the Ecosystem based vision of Biodiversity Conservation for the Amazon Biome

Objective

Consolidate a shared ecosystem vision of conservation of biological and cultural diversity of the Amazon biome, that contributes to the effective administration and management of protected area systems and the maintenance of goods and services, integrity, functionality and resilience of the Biome against the effects of natural and anthropogenic pressures and in the context of climate change.

Actions

- Identifying the different governmental and intergovernmental spaces, as well as those of international and national NGOs on specific thematic areas and specialties, and all other relevant levels of the decision making process, to socialize the progress in the process of the ecosystem based vision of biodiversity conservation for the Amazon Biome and regional PWPA , so that commitments are conceived regarding technical and financial cooperation to strengthen the regional work developed so far.
- Moving forward with the design and coordination of the action plan to consolidate the process of the ecosystem based vision of biodiversity conservation for the Amazon Biome, promoting the participation of different stakeholders.
- Progressing in processes of national and regional management to facilitate incorporation into the agenda of governments surrounding the issue of

55. The Ecosystem Approach provides a holistic vision oriented towards the continuous supply of environmental goods and services by maintaining essential ecological processes and the active participation of all sectors involved in its management. The Ecosystem Approach recognizes that natural and transformed ecosystems are complex systems whose operation and responsiveness to disturbance and change (resilience) depend on the dynamic relationships among species, and among these, the environment, society and culture. The Ecosystem Approach, thus, integrates the various sciences of the biophysical and socio-economic ambience with traditional knowledge, including their disciplines, practices, methodologies and systems of innovation. People and culture are an integral part of ecosystems and therefore management objectives are the subject of social decision.

adjoining PA's and the process of construction and implementation of the conservation vision.

- Managing jointly regional projects that allow for providing more dynamics and continuity in the process of the ecosystem based vision of biodiversity conservation for the Amazon Biome, according to the themes promoted.
- Consolidating and coordinating the work of the thematic teams, which must be built in such way, so that the latter become the technical and conceptual support that leverages the continuity of the process of the ecosystem based vision of biodiversity conservation for the Amazon Biome and the development of the PWPA at regional level.
- Strengthening regional inter-agency coordination levels and mechanisms: REDPARQUES, ACTO, CAN, IUCN, SCBD, as well as those that provide support: scholars, NGOs: WWF, TNC, WCS, CI, etc. to facilitate the implementation of the actions proposed under the framework of the construction of the ecosystem based vision of biodiversity conservation for the Amazon biome and the PWPA at regional level.
- Identifying similarities between the construction of the Ecosystem Based Vision of Biodiversity Conservation for the Amazon Biome with other regional initiatives such as the Biodiversity Action Plan of the ACTO, the biocide program the Andean Community of Nations, Amazonian Guianas' Shield Initiatives, AVINA Amazon, Amazon Andes of USAID, the Amazon Initiative of WWF, among others, to manage regional cooperation work that articulates actions of common interest.

Summary of progress and challenges in the objectives and goals of the Program of Work on Protected Areas

Element 1. Conducting actions geared at planning, selecting, creating, strengthening and managing systems and protected area sites.

Objetive 1.1

Creating and strengthing national and regional protected area sites integrated in a worldwide network, as a contribution to the worldwide agreed goals.

Goal

By 2010, in the land area and by 2012 in the marine area, a global network of national and regional comprehensive, representative and effectively managed protected areas will have been created as a contribution to (i) the goal of the Convention's Strategic Plan and World Summit on Sustainable Development to achieve a significant reduction in the rate of biodiversity loss by 2010, (ii) the Millennium Development Goals - particularly goal 7 on ensuring environmental sustainability, and (iii) Global Strategy for Plant Conservation

Summary of progress

The Amazonian states have substantially increased their protected areas in the last two decades, especially in the land domain. Similarly, planning exercises have been conducted for the selection of areas and sites with voids and priority for conservation. At regional level, there is progress in the definition of a portfolio of land and freshwater priority conservation areas in which criteria of representativeness, ecosystemic function and integrity are considered.

From an ecological regional perspective (large landscapes, and biomes) some criteria have been laid down (representativeness, functionality of water systems, macro-regional ecological connectivity, support of macroclimatic process and maintenance of biotic phenomena at regional level), as well as additional conservation sites, complementary to the regional prioritization exercise so far advanced.

Also, it is currently under consideration to carry out other conservation actions in ecosystems with transformation processes: Agroecosystems, infrastructure development scenarios, among others.

In some areas of the Amazon region there are currently planning and cooperation processes which generate added value to the conservation of cross border ecosystems.

Important sites and criteria are identified for conservation at regional scale, including areas threatened by human pressure and areas of high ecological and cultural value.

The region also has other alternative forms of protection of biodiversity by the private sector: rights of way, ecological reserves, private reserves of civil society, conservation concessions, concessions for ecotourism, among others.

Table 34. Planned actions and deadlines

Strategic action	Activities	Term (years)		
		Short (1-4)	Medium (5-7)	Long (8-10)
Achieving an agreement on goals and priorities for the conservation of biological and cultural diversity from a regional perspective and start the planning action processes in the priority areas	Agreeing on a methodological route and plan to reconcile the national conservation goals with regional needs.	X		
	Moving forward in the consolidation and implementation of criteria that strengthen the portfolio of priority sites for conservation from a regional perspective and that integrates land and freshwater ecosystems for the maintenance of ecosystemic services as well as criteria, elements and sociocultural and economic processes.	X		
	Defining and implementing jointly proposals to classify conservation targets (Broad and Narrow Filter).	X		
	Arranging sites and adjacent blocks, as an opportunity to advance cross-border cooperation processes.	X		
	Advancing in planning cooperative-action processes to achieve conservation areas and / or prioritized blocks.		X	X

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Objetive 1.2

Integrating the protected areas into wider landscapes and seascapes in order to maintain ecological structure and function.

Goal

By 2015, all protected areas and protected area systems are integrated into broader landscapes and seascapes and relevant sectors, applying the ecosystem approach and taking into account ecological connectivity and the concept, where appropriate, of ecological networks.

Summary of progress

The region is in the process of defining a portfolio of land and freshwater conservation areas from a regional perspective in which criteria of representativeness, ecosystem function and integrity are considered. On the other hand, some essential areas for the maintenance of connectivity processes on a larger macro-regional scale have been identified.

Table 35. Planned actions and deadlines

Strategic action	Activities	Term (years)		
		Short (1-4)	Medium (5-7)	Long (8-10)
Strengthening the process of defining portfolio priority conservation areas from a regional perspective, integrating land and freshwater ecosystems, as well as other criteria and socio-cultural and economic elements.	Developing protocols to design and implement ecological corridors and other connectivity figures with participation of local indigenous communities, etc.	X	X	
	Creating the conditions for the establishment of cross border marine AP and the integration of these into land Pas.		X	X

Objetive 1.3

Creating and strengthening regional networks, cross border protected areas (TBPAs) and collaboration between adjoining protected areas across national boundaries.

Goal

To establish and to strengthen, by 2010 / 2012, cross border protected areas, other forms of cooperation between neighboring protected areas across national boundaries and regional networks geared at intensifying conservation and sustainable use of the biological diversity, applying thereby the ecosystem approach and improving international cooperation.

Summary of progress

The vast majority of the Amazonian countries have adjoining protected areas and in several of them these countries have interesting coordination mechanisms for the effective management of these protected areas. So far about 10 cross-border experiences have been formalized wherein not only networks with institutional networks and players have been formed, but also local communities, including indigenous ones, have become part of the process.

On the other hand, one of the most significant achievements in the execution of PWPA is the creation of the Inter–agency network for the construction of the ecosystem based vision of biodiversity conservation for the Amazon Biome, coordinated by REDPARQUES and supported by the World Wildlife Fund (WWF), the International Union for Conservation of Nature (IUCN), the Secretariat of the Convention on Biological Diversity, and with the participation of the Amazon Cooperation Treaty Organization (ACTO) and the Andean Community of Nations. This initiative is being implemented through thematic nodes, supported by NGOs and other institutional stakeholders at national and regional level. These nodes are working to identify common mechanisms which may facilitate the definition of cross border PAs and as well as their effective management and administration.

Table 36. Planned actions and deadlines

Strategic action	Activities	Term (years)		
		Short (1-4)	Medium (5-7)	Long (8-10)
Making progress in national and regional management processes to facilitate incorporation into governments´ agendas the topic of cross border PAs and to formalize multilateral agreements between adjoining protected areas.	Moving forward in the consolidation and implementation of criteria that strengthen the portfolio of priority sites for conservation from a regional perspective and that integrate land and freshwater ecosystems for the maintenance of ecosystemic services as well as socio-cultural and financial criteria, elements and processes.	X	X	
	Defining and implementing strategies geared at ensuring the support and political commitment in the regional cooperation processes to strengthen networks and for effective management of adjacent protected areas.		X	X

Objetive 1.4

Improving substantially the planning and management of site based protected areas.

Goal

By 2012, all protected areas have effective management in place based on very participatory and scientifically sound planning processes to which clear objectives, targets, management strategies and monitoring programs of biological diversity are incorporated, building on existing methodologies and a long term management plan which involves direct stakeholders.

Summary of progress

In some countries of the Amazon biome, the management of protected areas is based on the design and implementation of management plans in situ. However, it is appropriate to reinforce long term adaptive management processes and planning, which incorporate monitoring and evaluation indicators of both management and the conservation of biological and cultural diversity in situ. Likewise, site management plans must be articulated to strategic plans of PA systems to ensure coordination and technical, operational and financial coordination among the PASs.

At regional level, progress has been made in some adjacent protected areas in the joint design of projects under management strategic plans aimed at strengthening management capabilities and management of biodiversity as well as the national systems of conservation areas improving this way regional coordination, the integrity of ecosystems and the living conditions of local communities as well as achieving greater ecological representativeness, coverage and connectivity through improved strategies of governance, social participation and integration.

Table 37. Planned actions and deadlines

Strategic action	Activities	Term (years)		
		Short (1-4)	Medium (5-7)	Long (8-10)
Developing, strengthening and harmonizing comprehensive administration and management plans of protected areas with a regional focus, with a long term adaptive vision, and that also include management and administration monitoring and evaluation systems, as well as biological and cultural diversity.	Coordinating and harmonizing the planning of protected areas in relation to the strategic plans of the systems and in respect of sector initiatives at regional level based on the ecosystem approach.		X	X
	Sharing of AP planning and management methodologies experiences to strengthen subregional planning initiatives that contribute to effective conservation and sustainable use of biodiversity at regional scale.	X	X	X
	Developing management and planning models of protected areas to strengthen regional level processes and to integrate protected areas into land use planning initiatives.		X	X

Objetive 1.5

Preventing and mitigating the negative impacts of major threats to protected areas.

Goal

By 2008, to have in place effective mechanisms to identify and to avoid and/or mitigate the negative impacts of serious threats to protected areas.

Summary of progress

While studies have been undertaken and major threats have been identified, analyzed and prioritized in terms of their impact on the Amazon ecosystem and progress has been made in reviewing and presenting status indicators (ecological integrity) and pressure, the region is still weak in defining, developing and implementing strategies to prevent or to mitigate threats, such as timely environmental impact assessments of projects on protected areas. The countries must also work together on the definition of legal liability, preventive and redress measures, incorporating the "polluter pays" principle or other appropriate mechanisms in relation to damages to protected areas, as well as timely environmental impact assessments of plans and projects on protected areas, especially of those at the regional level.

Table 38. Planned actions and deadlines

Strategic action	Activities	Term (years)		
		Short (1-4)	Medium (5-7)	Long (8-10)
Moving forward in regional processes of analysis, modeling, prevention and mitigation of impacts on PA caused by extractive activities, infrastructure, climate change, agricultural expansion and all other development activities	Designing and implementing training programs in impact assessment, monitoring plans, mitigation, strategic environmental assessments, etc. to strengthen national and regional technical capacity.	X	X	
	Developing and agreeing on a classifying system (indicators, variables, methods, models and scales of information) approved for the regional analysis of status and pressures on ecosystems and regional Protected Areas.	X	X	
	Developing arrangements for establishing a regional monitoring structure based on the various ongoing initiatives.	X	X	
	Supporting the creation of communication and dialogue arenas in respect of the progress made by the countries in relation to the study of the Climate Change phenomenon: analysis of scenarios analysis, vulnerability, impacts, strategies and tools for mitigation, adaptation, etc. to jointly define technical, operational and financial strategies of mitigation and adaptation in PA systems.	X	X	
	Moving forward in technical cooperation processes for analysis and modeling of impacts on AP activities such as: i) mining, ii) exploration and exploitation of hydrocarbons, iii) infrastructure: hydropower, iv) non-regulated hunting, v) disposal of waste in urban centers and vi) fire in relation to climate change and agricultural expansion.	X	X	X
	Advancing on subregional technical cooperation for the implementation of early warning systems in areas that are expected to implement high impact activities and projects.	X	X	
	Encouraging participation and social and corporate responsibility for the adoption of best practices in important areas, which contribute to the conservation of biological and cultural diversity.	X	X	

Strategic action	Activities	Term (years)		
		Short (1-4)	Medium (5-7)	Long (8-10)
Moving forward in regional processes of analysis, modeling, prevention and mitigation of impacts on PA caused by extractive activities, infrastructure, climate change, agricultural expansion and all other development activities	Strengthening the various mechanisms of control and monitoring of protected areas for conservation of biological biodiversity.	X	X	X
	Establishing appraisal mechanisms of environmental goods and services on the importance of the Amazon region protected areas as a strategy for biodiversity conservation and adaptation in respect of climate change.		X	X
	Promoting the implementation of Strategic Environmental Assessments (SEA) of sector policies, plans and programs of regional scope, as a strategy to prevent significant environmental effects.	X	X	X
	Analyzing the proposals put forward by the Amazonian countries in relation to REDD, in order to facilitate the exchange of information and experiences.	X		
	Sharing information and methodologies related to the sustainable use of natural resources of the protected areas.	X	X	X

Element 2. **Governance, participation, equity and share in benefits.**

Objetive 2.1

Promoting Equity and participation in benefits

Goal

Establishing by 2008 mechanisms for equitable sharing of both costs and benefits arising from establishing and managing protected areas.

Summary of progress

Amazonian countries have made progress in establishing participation processes in the planning, administration and management of protected areas. There are concrete experiences of citizen participation in which states have formally recognized local participation in protected area management and have made changes in environmental regulations both to expand participation and to enforce the creation of formal spaces for local participation

There are several forms of co-operation, co-management and consultation arrangements. However it is important to further deepen on mechanisms of equitable participation of both costs and benefits arising from the establishing and managing of the PAs.

At regional level, there has been progress in transnational processes of regional integration and cooperation to strengthen the capabilities to manage and to handle biodiversity and PA systems and to achieve greater ecological representativeness, coverage and connectivity as well as to improve governance.

Table 39. **Planned actions and deadlines**

Strategic action	Activities	Term (years)		
		Short (1-4)	Medium (5-7)	Long (8-10)
Studying, assessing and promoting with involvement of the different players , the strategies, figures and tools for conservation and management of biological and cultural diversity and other natural resources to show alternatives that allow for effective management and conservation of areas of biological, cultural and economic importance.	Moving forward on participative assessments of existing models and governance processes, formal or informal, in order to achieve the goals of conservation and development with emphasis on transnational processes.	X	X	
	Establishing mechanisms to exchange regional experiences in the management of protected areas: i.e. shared management, best practices, forms of land tenure, lessons learned in terms of PA governance, etc.	X	X	
	Promoting capability strengthening processes that incorporate: i) the diversity of players with shared responsibilities and competences in AP management and ii) the skills required by new forms of governance (communication, negotiation, facilitation, coordination of actors, conflict management , etc.).	X	X	
	Sharing experiences on sustainable use and management of biodiversity goods and services in protected areas and conservation areas, to help improve the standard of living of the populations settled in said geographical areas.	X	X	
	Supporting initiatives for sustainable use and management of goods and services derived from biodiversity (ethnic tourism, ecotourism, etc.) Driven by indigenous and local communities in the PAs.	X	X	
	Strengthening the capacities of institutions, indigenous, Afro-American and local communities in cross border protected areas with the purpose of protecting traditional knowledge, traditional practices and innovations for use and management in PA Biodiversity.	X	X	X
	Promote and share experiences of assessing costs, benefits and economic and sociocultural impacts arising from the establishment and maintenance of protected areas, particularly for indigenous and local communities.	X	X	
	Analyzing the different mechanisms and incentives promoted by the Amazonian countries for management and conservation of private protected areas, in order to identify common tools that contribute to the sustainability of this protection figure at regional level.	X	X	X

Objetive 2.2

Intensifying and strengthening participation of indigenous and local communities, as well as all relevant stakeholders.

Goal

By 2008, achieving full and effective participation of indigenous and local communities, fully respecting their rights and recognizing their responsibilities, in accordance with national laws and applicable international obligations; and involvement of other relevant stakeholders in the management of existing protected areas and in the creation and management of new protected areas.

Summary of progress

LThe general trend in the region is the significant progress made in terms of legal recognition of indigenous rights. This is reflected in the ratification of ILO Convention 169 and in the constitutions of the Amazonian states. The recognition of rights to land and ancestral territories of indigenous peoples has been one of the most important progresses made, since in most Amazonian countries ownership ti-

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tles have been issued, which recognize indigenous rights over extensive land areas. However, it is important to continue promoting a favorable environment, strengthened by the implementation of legislation and policies, as well as in the development of capacity and resources for effective participation of indigenous and local communities and others involved in the decision making process and in the creation and administration of the PAs.

One of the main conflicts corresponds to the overlapping between the protected area figure and indigenous territories. The process continues to reach agreements in respect of issuance of ownership deeds and property right of indigenous territories on the grounds that their occupation was prior to any other occupation, and on the basis pf legal commitments of historical and international nature that the States have undertaken.

The progress made in terms of new conditions for cooperation and dialogue between government representatives and indigenous communities is undeniable; the above is reflected not only on the greater incidence on the decision making process in the management and handling of PAs, but also on the interest that some communities have for their territories to become part of national systems of protected areas.

Table 40. Planned actions and deadlines

Strategic action	Activities	Term (years)		
		Short (1-4)	Medium (5-7)	Long (8-10)
Sharing experiences to facilitate and strengthen participatory and communication processes with local communities, indigenous peoples and Afro-descendants, as well as other actors involved in the creation, management and planning of protected areas.	Supporting assessment and experience sharing exercises on effective mechanisms for participation of stakeholders in creating and jointly managing conservation figures and, in general of governance related figures in protected areas.	X	X	X
	Generating processes for strengthening local and institutional capacities for joint administration and management of protected areas.	X	X	X
	Systematizing and exchanging experiences on participation processes of all stakeholders in the monitoring of development projects which have an impact on protected areas and lands of indigenous and local communities.	X	X	X

Element 3. **Favorable Activities.**

Within the Program of Work on Protected Areas, favorable activities make reference to various aspects, including a favorable policy, institutional and socio-economic environment for protected areas; capacity for planning, creation and management; communication, education and public awareness mechanisms, application of appropriate technologies; and mechanisms to ensure financial sustainability of the protected areas.

In the framework of building the ecosystem based vision of conservation, this element focuses on the issue of financial sustainability for the conservation and management of protected areas in the Amazon region. However, other issues addressed in this element are considered in other objectives and goals of the program since, within the framework of the PWPA, the four elements are linked to one another and when applied they are mutually reinforced.

Objetive 3.4

Ensuring financial sustainability of protected areas and national and regional systems of protected areas.

Goal

By 2008, sufficient resources to cover the costs of implementing and effectively managing national and regional systems of protected areas were obtained, both national and international sources.

Summary of progress

The region as a whole, in the framework of consolidating the process to build the vision of conservation of the Amazon Biome, has begun a preliminary exercise on PA Financial Sustainability at regional level. Said exercise is based on analyses and appraisal of the financial sustainability that most of the countries have conducted based on the score sheet developed by UNDP.

According to regional analysis, it has been found that the State is the main source of income for PA's in the region with a participation of 74%, followed by international cooperation with 18%. Self-management related income is less than 10% of the resources available and is mostly generated by the entrance fee to the PA. This allows suggesting a diversified portfolio of income sources for conservation that guarantee long term resources and that do not depend too much on unstable sources.

In an initial investigation conducted in the context of the ecosystem vision, with software-projection system for the Conservation Minimum Investment (IMC) -, developed by Brazil[56] , was estimated to have

56. IMC is a product generated by a working group of financial sustainability developed and coordinated by the MMA, which was attended by the ICMBio, TNC, CI-Brasil and Brazilian Biodiversity Fund (Funbio). It is available on the website of the MMA-Brazil.

invested about US200 million in the consolidation of protected areas in Amazonia. This investment includes spending on infrastructure, equipment, management plans, among others. However, there is a gap in investment of about US 500 million for all of these protected areas to reach minimum levels of management effectiveness. It was also estimated that the annual demand to cover the recurrent costs of protected areas in the biome, after the minimum investments made to cover the financial gap mentioned above, will be approximately US 250 million. Currently, the joint annual budgets of the Amazon countries are close to 40% of this value.

Table 41. Planned actions and deadlines

Strategic action	Activities	Term (years)		
		Short (1-4)	Medium (5-7)	Long (8-10)
Developing a comprehensive analysis at regional level (based on estimates and tools implemented by countries) on financing needs and define and manage a regional strategy for financial sustainability for protected areas of the Amazon biome.	Consolidate a standardized regional information protocol for financial sustainability, considering the experiences as of ACTO or Ministry of Environment of Brazil and jointly analyzing regional information needs and gaps.	X		
	Carrying out studies to incorporate environmental variables in the national accounts.	X	X	X
	Develop systematic economic valuation exercises, emphasizing on ecosystem services, at Amazon biome scale, showing the profits and the economic contribution to regional development.	X	X	
	Identify and manage sources and financial mechanisms for sustainable management of protected areas in the biome.	X	X	
	Advancing in systematizing, studies and exchange of experiences and training, to include in the systematic planning of the subject areas of financial sustainability.	X	X	
	Perform periodic upgrades, evaluations and systematization of information on the analysis of financial sustainability in the Amazon region using score sheets of financial sustainability and other appropriate instruments to conduct regional analysis.	X	X	
	Generate training process on the issue of financial sustainability and implementation of tools through REDPARQUES platform, aimed at government officials and staff working in PA's	X	X	
	Analyze, systematize and document lessons learned and regional financial mechanisms that could contribute to the financial sustainability of protected areas in the Amazonian biome.	X	X	X

Element 4. **Regulations, assessment and supervision.**

Aspects such as the creation and implementation of minimum standards and best practices on planning and management, governance and participation in protected areas, as well as evaluating the management effectiveness, trends in the conservation of biodiversity and the contribution of scientific knowledge in the establishment and effectiveness of protected areas, are taken into consideration in this PWPA element. Such aspects are to some extent contained in the other objectives and goals of the PWPA. Therefore, this report focuses on matters related to the efficient administration and management of protected areas.

Objetive 4.2

Assess and improve the effectiveness of protected area management.

Goal

By 2010, frameworks for monitoring, assessment and reporting related to the effectiveness of site management and national and regional systems of protected areas and cross border protected areas were adopted and implemented by the Parties.

Summary of progress

The experience which the Amazon countries have gained regarding development, adaptation and application of tools for monitoring and evaluating the management effectiveness of protected areas is noteworthy. Almost all of said experiences are based on the Framework of the World Commission on Protected Areas (WCPA) of IUCN, which proposes to consider six so – called "moments" in an analysis of effectiveness: context, planning, supplies, processes, products and outcomes. Context is perhaps the most extensively worked element, followed by planning and supplies. On the contrary, products and results are the least addressed elements by the tools applied in the Amazon.

There is still little experience in assessing and measuring impacts or outcomes of protected areas in conservation and ecological integrity at regional and global scale. The aforementioned phenomenon makes it difficult to develop a clear link between EEM and the general planning of protected areas and therefore adaptive management. In addition, there is a divorce between research, planning and evaluation.

The assessment tasks performed have contributed to the updating and collection of baseline information on the Protected Areas and to highlight threats to the values of place, weaknesses in management and in some countries that have management plans, these assessment tasks help update and adjust those plans and establish a continuous process of monitoring and assessment of decision making regarding handling and management of PA's.

Regionally, spaces have been created in order to make progress in a common methodological framework for assessing management effectiveness of the surrounding areas, based on the experiences developed by the countries and the international instruments which have been set forth for this purpose. Additionally, support is being provided to the establishment of a system of permanent exchange of experiences and information, as well as a regional proposal for the integration of analysis of management effectiveness in protected areas.

Table 42. Planned actions and deadlines

Strategic action	Activities	Term (years)		
		Short (1-4)	Medium (5-7)	Long (8-10)
Advance in the learning process, concepts, information exchange and systematization and analysis of results of EEM at different scales, identifying strengths and weaknesses that contribute to effective management of protected areas in the Amazonian biome.	Promote capacity - building activities to ensure that the 9 countries of the region manage to achieve and institutionalize the analyses of management effectiveness of their protected areas so as to have a full regional scenario.		X	
	Develop a standardized protocol for sharing information on evaluation of management effectiveness of protected areas.	X		
	Coordinate with RedLAC other funding sources in order to promote support for the activities of monitoring and evaluation of management effectiveness of protected areas.	X		
	Strengthen effectiveness analysis processes and their subsequent incorporation in the process of planning, management and operation of each country by means of the exchange of experience and training.	X	X	X
	Advancing development process of pilot management effectiveness in border areas, strengthening the management plans.	X	X	
	Perform analysis of management effectiveness of PA systems integrating the elements which characterize the financing system.		X	
	Consider the MA processes at the regional level other issues that are gaining interest as are the certification of protected areas and implementation of ecological corridors.			X
	Generate a process of study and learning to integrate the cultural issue in the analysis of effectiveness according to the needs of each country.	X	X	X
	Promote regional workshops with staff of institutions responsible for protected area by management effectiveness, in order to review their tools and develop indicators and variables that cover missing elements of the Reference Framework for Management Effectiveness of WCPA, specifically Context, Products and Results and adapt to regional scale.	X		
	Support the analysis that correlates the results of effectiveness of management governance variables and categories of protected area management.			X

Bibliography Quoted

Alex Rivas Toledo, comp (2006). Governance of the National Systems of Protected Areas in the Tropical Andes: Regional Diagnostic and comparative analysis, IUCN, Quito, Ecuador, 71 pp. (Original title in Spanish Language: Gobernanza de los Sistemas Nacionales de Áreas Protegidas en los Andes Tropicales: Diagnóstico regional y análisis comparativo).

Arévalo, L. M. Ruiz SL, and Tabares E., (eds). in 2008. Biodiversity Action Plan ¬ Dad South of the Colombian Amazon. Corpoamazonia, Humboldt Institute, Institute Sinchi, UAESPNN. Bogotá DC Colombia. P. 196. (Original title in Spanish Language: Plan de Acción en Biodiversidad del Sur de la Amazonia Colombiana)

Artaxo, Paulo. 2006. The Amazon and global changes. Ciência Hoje 224: 20-25. Original Portuguese title: A Amazônia e as Mudanças Globais.

Avissar, R. and Werth, D., 2005: How Many Realizations Are Needed To Detect A Significant Change In Simulations Of The Global Climate? Eos Trans AGU.

Bovarnick Andrew. in 2008. Scorecard Financial Sustainability for National Systems of Protected Areas. (Original title in Spanish Language: Ficha de Puntaje para Sostenibilidad Financiera para Sistemas Nacionales de Áreas Protegidas).

Center for research, training and information to the Amazon Service, PRONATA. Sf. The Chagres space roles, learning and self-sufficiency. (Original title in Spanish Language: La chagra: un espacio de roles, aprendizajes y autoabastecimiento).

Latin American Center for Social Ecology (CLAES, from its original Spanish Language initials: Centro Latino Americano de Ecología Social). 2010. Trends in environment and development in South America. 2009 to 2010. (Original title in Spanish Language: Tendencias en ambiente y desarrollo en America del Sur)

Amazon Development Commission and the environment. 1994. Amazonia without myths. Bogota Ed Oveja Negra. 253 p. (Original title in Spanish Language: Amazonia sin mitos).

Cox. P. M., R. A. Betts, C. D. Jones, S. A. Spall, and l. J. Totterdell. 2000. Acceleration of global warming due to carbon-cycle feedbacks in a coupled climate model. Nature, 408, 184-187.

Cox PM, R. A. Betts, M. Collins, PP Harris, C. Huntingford and CD Jones. 2004. Amazonian forest dieback under climate-carbon cycle Projections for the 21st century. Theorethical and Applied Climatology, 78, 137-156.

Cracco, M., J. Calvopiña, J. Courrau, MM Medina, I. Novo, I. Oetting, J. Surkin, R. Ulloa and P. Vásquez. 2006. Strengthening management effectiveness of protected areas in the Andes. Comparative analysis of existing tools. IUCN. Quito, Ecuador. (Original title in Spanish Language: Fortalecimiento de la efectividad de manejo de áreas protegidas en los Andes. Análisis comparativo de herramientas existentes)

Da Silva, JMC, AB Rylands, and GAB da Fonseca. 2005. "The Fate of the Amazonian Areas of Endemism". In: Conservation Biology, vol. 19, No. 3, p. 689-94.

De la Hoz Nelsa. 2005. Tusi Dance Of The Rainbow Boa, Ritual, Social And Ethnic Identity Andoke, Middle Caquetá, Colombian Amazonia. Universidad de los Andes. Faculty of Social Sciences, Department of Anthropology, Centre for Socio-Cultural and International Studies. Bogota (Original Title in Spanish Language: Baile de Tusi, de la boa al arcoiris: rito, relaciones sociales e identidad de la etnia Andoke, medio río Caquetá, Amazonia Colombiana).

De la Torre A.. Fajnzylber P and Nash, J. 2009. Development with Less Carbon: Latin American Responses to the Challenges of Climate Change. International Bank for Reconstruction and Development / World Bank. Washington, D. C. (Original title in Spanish Language: Desarrollo Con Menos Carbono: Respuestas Latinoamericanas al Desafío del Cambio Climático).

Forsberg, B., Devol R., Richey A. J., Martinelli L. and H. Dos Santos. 1988 "Factors Controlling Nutrient Concentration in Amazon Floodplain Lakes." In: Limnology and Oceanography. Vvol. 33, No. 1, p. 41-56.

Friedlingstein, P., J. L. Dufresne, P. Cox, P. Rayner. 2003. How positive is the feedback entre climate change and the carbon cycle? Tellus B 55, 692-700.

Gentry, A, 1990. The Amazon region. In: Rain Forest of Colombia. 53-64 (Villegas, ed.). Bogota (Original Title in Spanish language: La región amazónica. En: Selva húmeda de Colombia)

Gullison, R. E., P. C. Frumhoff, J. G. Canadell, C. B. Field, D. C. Nepstad, K. Hayhoe, R. Avissar, L. M. Curran, P. Friedlingstein, C. D. Jones, and C. Nobre. 2007. Tropical forests and climate policy. Science, 316: 985-986

Hannah, L., Midgley, G., Andelman, S., Araújo, M., Hughes, G., Martinez-Meyer, E., Pearson, R. and Williams, P. 2007. Protected Area Needs in a changing climate. Frontiers in Ecology and the Environment, 5 (3): 131-138.

Amazon Institute of Scientific Research - SINCHI. 2007. Annual report on the state of ecosystems and the environment of the Colombian Amazon 2006. Bogota (Original Title in Spanish Language: Balance anual sobre el estado de los ecosistemas y el ambiente de la Amazonia Colombiana 2006)

KILLEEN, Timothy. 2007. "A Perfect Storm in the Amazon region: development and conservation in the context of the Initiative for Regional Infrastructure Integration (IIRSA)". In: Advances in Applied Biodiversity Science, No. 7. Conservation International. (Original title in Spanish Language: Una tormenta perfecta en la Amazonía: desarrollo y conservación en el contexto de la iniciativa para la Integración de la Infraestructura Regional Sudamericana (IIRSA)").

Malhi Y. y J. Wright. 2004. Spatial patterns and recent trends in the climate of tropical rainforest regions. Philos Trans R Soc Lond B Biol Sci. 359 (1443): 311 – 324.

Mansourian, S., Belokurov, A. & Stephenson, PJ 2008. The role of forest protected areas in climate change adaptation. World Wildlife Fund - WWF International. Gland, Switzerland. (Original title in Spanish language: La función de las áreas forestales protegidas en la adaptación al cambio climático. Fondo Mundial para la Naturaleza).

Mansourian, S. 2006. Joining the dots: species and protected areas - A contribution to the CBD Programme of Work on Protected Areas. Gland, Switzerland, WWF.

Marengo, J.; U. Bhatt y C. Cunningham. 2000 "Decadal and Multidecadal Variability of Climate in the Amazon Basin". En: International Journal of Climatology.

Marengo, JA 2006. Drought in Amazonia. State of the Climate in 2005: S70, 2006. http://www.ncdc.noaa.gov/oa/climate/research/2005/ann/bams2005/annsum_samerica.pdf

Martino, Diego. 2007. Deforestation in the Amazon: the main stress factors and perspectives. In Revista del Sur N º 169-January / February 2007 (Original title in Spanish language: Deforestación en la Amazonía: principales factores de presión y perspectivas).

McCarty, JP 2001. Ecological Consequences of Recent Climate Change. Conservation Biology, 15: 320-331.

Melillo, JM, AD McGuire, DW Kicklighter, B. Moore, CJ Vorosmarty, AL Schloss, 1993: Global Climate Change and Terrestrial Net Primary Production. Nature 363: 234-240, 1993.

Miles, LA Grainger & O. Phillips. 2004. The Impact of Global Climate Change on Biodiversity in Amazon tropical forest. Global Ecol. Biogeographical., 13, 553-565

Ministry of Environmental Affairs, Secretary of Biodiversity and Forests, Department of Protected Areas. - Brasília: MMA, 2007. National Report On Protected Areas In Brazil. 124p. 29 cm. (Protected Areas in Brazil Series, 5). (Original title in Portuguese Language: Informe nacional sobre áreas protegidas no Brasil).

Mittermeier R., Goettsch, C. Pilgrim, J. Fonseca, G. Konstant W. And Brooks T. 2002. Wilderness areas. The last unspoiled regions of the world. CEMEX, Mexico D. F. (Original title in Spanish language: Áreas silvestres. Las últimas regiones vírgenes del mundo).

Nepstad, D. 2007. The vicious cycles of the Amazon. Drought and fire in the greenhouse. Gland, Switzerland: WWF International. (Original title in Spanish language: Los círculos viciosos de la Amazonía. Sequía y fuego en el invernadero).

Nep tad, D.WWF Towards a Comprehensive Strategy for Conservation of the Amazon. Climate change and agriculture / livestock expansion. MS.

Nijssen, b., g. M. O'donnell, a. F. Hamlet and d. P. Lettenmaier. 2001. Hydrologic Sensitivity of Global Rivers to Climate Change. Vol 50, No. 1-2, pp. 143-75.

Nobre, CA, EDAssad & MD Oyama. 2005. Environmental change in Brazil: the impact of global warming on ecosystems and agriculture in the Amazon. Sci Am Brazil, Special Issue: A Terra na Stove, 70-75. (Original title in Portuguese language: Mudança ambiental no Brasil: o impacto do aquecimento global nos ecossistemas da Amazônia e na agricultura).

Amazon Observatory, Colombia node. 2007. Situation of Economic, Social and Cultural Rights in the Colombian Amazon. Bogota DC, Colombia: ILSA (Original title in Spanish Language: Situación de los Derechos Económicos Sociales y Culturales en la Amazonía Colombiana).

United Nations Office on Drugs and Crime, UNODC - Government of Colombia. Integrated Illicit Crop Monitoring (SIMCI – from its original Spanish language initials: Sistema Integrado de Monitoreo de cultivos ilícitos). Coca cultivation survey 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006 and 2007

Olson, DM & Dinerstein, E. (2002. The Global 200: Priority ecoregions for global conservation. Annals of the Missouri Botanical Garden Volume 89: 199-224

Paredes, G. 2007. Risk management in the context of management planning of protected areas. Environmental assessment and risk management in protected areas from Colombia. UAESPNN. Bogotá, Colombia. (Original title in Spanish language: Gestión del riesgo en el contexto de la planeación del manejo de áreas protegidas. Evaluación ambiental y gestión de riesgo en áreas protegidas desde Colombia).

Parker, C., Mitchell, A., Trivedi, M. & Mardas, N. 2009. The little REDD + Book. Global Canopy Foundation Ed.Oxford, UK.

PREDECAN & GTZ. 2005. Incorporation of risk analysis in planning processes and public investment in Latin America and the Caribbean. Lima – Peru (Original title in Spanish Language: Incorporación del análisis del riesgo en los procesos de planificación e inversión pública en América Latina y el Caribe).

United Nations Environment Programme (UNEP), Treaty Organization (ACTO), Research Center of the University of the Pacific (CIUP). 2009. Environmental perspectives in the Amazon. Amazon Geo. P. 167. (Original title in Spanish language: Perspectivas del medio ambiente en la Amazonía).

United Nations Environment Programme (UNEP) and Treaty Organization (ACTO). 2009. Environmental perspectives in the Amazon - GEOAMAZONIA. UNEP / ACTO. 167 p. . (Original title in Spanish language: Perspectivas del medio ambiente en la Amazonía).

Latin American Technical Cooperation Network on National Parks, other protected areas, flora and fauna - REDPARQUES. 2007. Document groundwork electronic forum "Indigenous peoples and protected areas in Latin America." February 5 to 26. http://

www.rlc.fao.org/foro/pueblos. FAO/OAPN Program (Original title in Spanish language: Documento base preliminar del foro electrónico "Pueblos indígenas y áreas protegidas en América Latina").

Rocha, MT 2008. The Amazon and climate change: scale of the problem and prospects for action by member countries of ACTO. Technical Documents / SP-ACTO v. 1. Organization of the Amazon Cooperation Treaty. Brasília. 156 p. (Original title in Spanish language: La Amazonía y el cambio climático: magnitud del problema y perspectivas de acción para los países miembros de la OTCA)

Rowell, A. PF & Moore, 2000. Global Review of Forest Fires. WWF / IUCN. Switzerland. In: http://www.iucn.org/themes/fcp/publications/files/global_review_forest_fires.pdf

Ruiz SL, Sanchez E., Tabares E., Prieto A., J. Arias C, Gomez R., D. Castellanos, García P., Rodriguez L. (Eds). 2007. Biological and cultural diversity of the south of the Colombian Amazon - Diagnosis. Corpoamazonia, Humboldt Institute, Institute Sinchi, UAESPNN, Bogotá DC-Colombia. 636 p. (Original title in Spanish language: Diversidad biológica y cultural del sur de la Amazonia colombiana – Diagnóstico).

Salazar, LF, CA Nobre and MD Oyama. 2007. Climate Change Consequences on the biome distribution in tropical South America, Geophys. Res Lett., 34, L09708.

Salazar, LF 2009. Climate change and the Amazon. Instituto Nacional de Pesquisas Espaciais. Cachoeira Paulista, SP. Brazil.

Sayer, J. 2005.Goals and targets of forest landscape restoration. EnS. Mansourian, D. Vallauri, N. Dudley, eds. Forest restoration in landscapes: beyond planting trees, pp.101-108. New York, USA, Springer.

Scheuren, J.-M., we Polain of Waroux, O., Below, R., Guha-Sapir, D. and Ponserre, S. 2007. Annual disaster statistical review: the numbers and trends 2007. Brussels, Belgium, Center for Research on the Epidemiology of Disasters.

Secretariat of the Convention on Biological Diversity (2004). Program of Work on Protected Areas (CBD work program.) Montreal: Secretariat of the Convention on Biological Biodiversity. 34 p.

Secretariat of the Convention on Biological Diversity, 2009. Connecting Biodiversity and Climate Change Mitigation and Adaptation: Report of the Second Ad Hoc Technical Expert Group on Biodiversity and Climate Change. Montreal, Technical Series No. 41, 126 pages.

Simms, A. 2006. Up in smoke? Latin America and the Caribbean: The Threat from climate change to the environment and Human Development. 3rd report, Working Group on Climate Change and Development. London, UK, New Economics Foundation.

Integrated monitoring system (SIMCI – from its original Spanish language initials: Sistema Integrado de Monitoreo de cultivos ilícitos) - UN. 2009. Coca crop monitoring. Census 2000, 2001, 2002.2003, 2004, 2005 and 2006

Soares-Filho BSA Nepstad, D., Curran, L., Voll, E., Cerqueira, G., Garcia, RA, Ramos, CA, Mcdonald, A., Lefebvre, P., Schlesinger, P. Modeling conservation in the Amazon basin. Nature, London, v. 440, p. 520-523, 2006.

Peruvian Society for Environmental Law - Sociedad Peruana de Derecho Ambiental. 2009. Private and community conservation in the Amazon countries. Lima - Peru. P. 342.

(Original title in Spanish language: Conservación privada y comunitaria en los países amazónicos).

International Union for Conservation of Nature - IUCN. 2006. Governance of national systems of protected areas in the tropical Andes. Regional diagnostic and benchmarking. Quito - Ecuador. (Original title in Spanish language: Gobernanza de los sistemas nacionales de áreas protegidas en los Andes tropicales. Diagnóstico regional y análisis comparative).

International Union for Conservation of Nature - IUCN. 2010. Overlapping of indigenous territories and protected areas in South America. Executive Summary. Paul Cisneros and James McBreen. Working Paper. P. 165. (Original title in Spanish language: Superposición de territorios indígenas y áreas protegidas en América del Sur. Resumen Ejecutivo).

Verweij, P. et al. 2009. Keeping the Standing Amazon: A matter of values. World Wildlife Fund.

Victoria, R.; l. Matinelli, J. Moraes, M. Ballester, A. Krusche, G. Pellegrino, R. Almeida & J. Richey. 1998. Surface Air Temperature Variations in the Amazon Region and Its Border Düring this Century. " In: Journal of Climate, 11, p. 1105-10.

WWF, Wetlands Foundation. in 2008. Biodiversity, ecological processes and ecosystem services. The challenge of maintaining an integrated Amazonia, functional and resilient to global climate change. Bogotá, Colombia. P. 36. Paper prepared as part of building conservation vision Amazon Biome. Germain Andrade, consultant. (Original title in Spanish language: Biodiversidad, Procesos Ecológicos y Servicios Ecosistémicos. El reto del mantenimiento de una Amazonia integra, funcional y resistente ante el cambio climático global).

WWF. in 2008. Amazon Network Initiative (ANI) Strategy. Version 1.0. ANI Working Group. Working Paper.

Attachments

Attachment 1. Ecosystem Approach principles and five operational guidelines for implementation

Ecosystem Approach principles

1. The objectives of land management, water and living resources are a matter of social choice.
2. Management should be decentralized to the lowest level appropriate.
3. Ecosystem managers should consider the effects (actual or potential) of their activities on other ecosystems.
4. It is necessary to understand the ecosystem in an economic context, so the potential gains from appropriate management can be acknowledged.
5. Conservation is a priority of the structure and functioning of the ecosystem, in order to maintain its services.
6. Ecosystems must be managed within the limits of their operation.
7. The Ecosystem Approach should be understood and applied in spatial and temporal scales.
8. Processes which characterize ecosystems vary on time scales, whereby management objectives should be proposed and planned in the long term.
9. It must de recognized that change is inevitable, as the foundation of management.
10. It is necessary to integrate the conservation and use of biological diversity in order to generate a sustainable ecosystem management.
11. All relevant forms of information, including scientific knowledge, indigenous and local innovations and practices, are to be considered.
12. All relevant sectors of society and scientific disciplines are to be included.

Operational guidelines for applying the Ecosystem Approach

1. Give priority attention to the functional relationships of biological diversity in ecosystems.
2. Improve the fair and equitable sharing of benefits arising from the operation of ecosystems (biodiversity).
3. Implementing adaptive management practices.
4. Implementing management measures at the appropriate scale for the issue being addressed, with decentralization, at the lowest level appropriate.
5. Ensure intersectoral cooperation.

Attachment 2.
Synthesis of progress and challenges in the process of the Ecosystem Based Vision of Biodiversity Conservation, and in the PWPA in the Amazon Biome (Decision VII/28)

Ecosystem Biodiversity Conservation Vision in the Amazon Biome: Summary of progress and projections		
Objectives	**Tasks Developed - Compliance**	**Actions to be pusued**
Consolidate a shared ecosystemic approach in terms of conservation of biological and of cultural diversity of the Amazon biome, contributing to the administration and effective management of protected area systems and the maintenance of ecosystem goods and services, integrity, functionality and biome resilience against the effects of natural and anthropogenic pressures as well as the context of climate change.	«Since 2008 REDPARQUES in direct support and coordination with the ACTO, IUCN, SCBD and NGOs: WWF, TNC, WCS and CI, has worked on the development of a regional working agenda aimed at strengthening the Regional Conservation Vision for Amazon biome. This agenda allows one to evaluate further progress in the implementation of the PTAP regional level through the following themes identified as a common concern: a) regional conservation opportunities in the Amazonian Biome b) integrating the vision of indigenous and local communities in terms of a conservation initiative c) analysis of the effectiveness of protected area management and d) review of financing strategies for protected areas. To this date, we have organized about eight (8) meetings with technicians from the Amazon protected area systems and experts on the topics proposed in the agenda. In addition, events have been organized with managers of protected areas systems to assess progress and to make decisions so as to strengthen the process. Some of the products in developing an agenda of work are: i) formation of working teams for the various topics discussed, ii) systematic information on the situation of each country rather than definede theme, iii) considering actions to be followed in achieving the consolidation of the process according to the theme and regional levels; iv) reports that consolidate the progress of the region in implementing the PTAP and building the ecosystem conservation vision of the Amazon Biome. v) Regional Inter-Agency Group made up and support through partnerships, building the vision of conservation and in general the development of regional PTAP. In addition, the process has yielded important agreements such as memoranda of understanding with UICN, WWF and the Secretariat of the Agreement for Biological Diversity. These are intended to provide and to manage the extent of the potential institutional and financial resources necessary for technical and scientific progress in this regional initiative.	Identifying the different governmental and intergovernmental venues, international and national NGOs on specific theme areas and specialties, and other relevant levels of decision making, to socialize the progress in the process of Ecosystem Biodiversity Conservation Vision of the Amazon Biome and of regional PTAP , so that commitments are conceived regarding technical and financial cooperation to strengthen the regional work so far performed. Moving forward with the design and coordination of the action plan to consolidate the process of Ecosystem Biodiversity Conservation Vision in the Amazon Biome, promoting the participation of different stakeholders. Progressing in processes of national and regional management, to facilitate incorporation into the agenda of governments surrounding the issue of PA›s and the process of construction and implementation of the ecosystem conservation vision. Jointly managing regional projects that drive more dynamicly and provide continuity in the process of Ecosystem Biodiversity Conservation Vision in the Amazon Biome according to the themes promoted. Consolidating and coordinating the work of the theme work goups contituted, so that the latter become the technical and conceptual support that leverages the continuing process of Ecosystem Biodiversity Conservation Vision in the Amazon Biome and in the development of regional PTAP. Strengthening levels and coordination mechanisms for regional inter - agencies: REDPARQUES, ACTO, CAN, IUCN, SCBD, as well as support: scholars, NGOs: WWF, TNC, WCS, CI, etc. to facilitate the implementation of the actions proposed under the construction of Ecosystem Biodiversity Conservation Vision in the Amazon Biome and regional PTAP. Identifying similarities between the construction of Ecosystem Biodiversity Conservation Vision in the Amazon Biome with other regional initiatives such as the Biodiversity Action Plan for the ACTO, the biocide program the Andean Community of Nations, Amazonian Guianas› Shield Initiatives AVINA Amazon Andes of USAID, the strategy of the WWF for conservation, among others, to manage regional cooperation work that articulates actions of common interest.

Summary of progress and challenges in the objectives and goals of the programme of		
Element 1: To conduct actions for planning, selecting, creating,		
Objectives	**Goals**	**Tasks Developed - Compliance**
1.1. To Create and to strengthen national and regional protected area sites integrated in a worldwide network, as a contribution to the worldwide agreed goals.	There shall be a network, by 2010, for a land area and by 2012 for a marine area, of global network of national and regional comprehensive, representative and effectively managed protected areas as a contribution to (i) the goal of the Convention›s Strategic Plan and World Summit on Sustainable Development to achieve a significant reduction in the rate of biodiversity loss by 2010, (ii) the Millennium Development Goals - particularly goal 7 on ensuring environmental sustainability, and (iii) Global Strategy for Plant Conservation	The Amazonian states have substantially increased their protected areas in the last two decades, especially in the terrestrial domain. Similarly, planning exercises have been conducted for the selection of areas and sites with gaps and priority for conservation. Regionally, there is progress in the definition of a portfolio of land and freshwater priority conservation areas in which criteria of representativeness, ecosystemic function and integrity are considered. From an ecological regional perspective (large landscapes, and biomes) some criteria have been laid down (representativeness, functionality of water systems, macro-regional ecological connectivity, support and maintenance macroclimatic process of biotic events at regional level), complemented by additional conservation sites and regional prioritization exercises that are advancing. Also, it is currently under consideration to carry out other conservation actions in ecosystems with transformation processes : Agroecosystems, infrastructure development scenarios, among others. In some areas of the Amazon there are currently planning and cooperation processes which generate added value to the conservation of cross border ecosystems Important sites and criteria are identified for conservation at regional level, including areas threatened by human pressure and areas of high ecological and cultural value. The region also has other alternative forms of protecting biodiversity by the private sector: easements, ecological reserves, private reserves of civil society, conservation concessions, concessions for ecotourism, among others.
1.2 Integrate protected areas in wider landscapes and seascapes so as to maintain ecological structure and function.	By 2015, all protected areas and protected area systems are integrated into the landscapes and seascapes and broader relevant sectors, applying the ecosystem approach and taking into account ecological connectivity and the concept, where appropriate, of ecological networks.	Progress is being made in defining a portfolio of land and freshwater conservation areas from a regional perspective in which criteria of representativeness, ecosystem function and integrity are considered. Some essential areas for the maintenance of connectivity processes on a larger macro-regional scale have been identified.
1.3 Building and strengthening regional networks, cross border protected areas (TBPAs) and collaboration among protected areas across adjacent national boundaries.	By 2010/2012 establishing and strengthening cross borderns protected areas, other forms of cooperation among neighboring protected areas across national boundaries and regional networks. (...)	In the region, cooperation processes are currently being carried out in areas of border protection. Interesting coordination mechanisms have been established for effective management of these adjacent areas. REDPARQUES is leading since 2008 and in partnership with WWF, the CBD Secretariat, IUCN, ACTO, WCS, etc. a regional dialogue on the one hand to assess the implementation of the Programme of Work on Protected Areas of the CBD and to define the vision of conservation of the Amazon Biome. This initiative is being implemented through the networking of thematic nodes, supported by NGOs and other institutional actors at the national and regional levels. These nodes are working to identify common mechanisms that facilitate the definition of transboundary PAs and their effective management and administration.

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strengthening and management of systems and protected area sites

Strategic Action	Tasks	Term(years)		
		Short (1-4)	Medium (5-7)	Long (8-10)
Achieving an agreement on goals and priorities for the conservation of biological and cultural diversity from a regional perspective and starting the action planning processes in priority areas	Agreeing on a methodological route and plans to reconcile the national conservation goals with regional needs	X		
	Progressing in consolidating and implementing criteria that strengthens the portfolio of priority sites for conservation from a regional perspective and integrating terrestrial and freshwater ecosystems for the maintenance of services and criteria, elements as well as sociocultural and economic processes.	X		
	Defining and implementing joint proposals for the classification of conservation targets (Braod and Narrow Filter)	X		
	Arranging sites and adjacent blocks, as an opportunity to advance in cross-border cooperation processes.	X		
	Progressing in planning cooperative processes - actions to achieve conservation areas and / or prioritized blocks		X	X
Strengthen the process of setting portfolio priority conservation areas from a regional perspective, integrating landscape of terrestrial and freshwater, as well as other criteria and socio-cultural and economic elements.	Develop protocols for design and implementation of biodiversity corridors - ecological and other figures of connectivity with the participation of local indigenous communities, etc.	X	X	
	Creating the conditions for the establishment of transboundary marine AP and the integration of these land PA's		X	X
Making progress in national and regional management processes so as to facilitate incorporation into the government›s agenda the issue of cross border PAs and so as to formalize multilateral agreements between adjoining protected area.	Progressing in consolidatingn and implementing criteria that strengthens the portfolio of priority sites for conservation from a regional perspective and integrating terrestrial and freshwater for the maintenance of ecosystem services and criteria, elements as well as sociocultural and economic processes.	X	X	
	Defining and implementing strategies to ensure the support and political commitment to regional cooperation processes that strengthen networks and that effectively manage adjacent protected areas.		X	X

Objectives	Goals	Tasks Developed - Compliance
1.4 Improving substantially the planning and management of protected areas based on the site	By 2012, all protected areas have effective, very participatory and scientifically sound management based site planning processes to which they incorporate clear objectives, targets, management strategies and monitoring programs of biological diversity, building on existing methodologies and a long term management plan which involves stakeholders.	In some countries of the Amazon biome, the management of protected areas is based on the design and implementation of management plans in in situ. However, it is appropriate to reinforce long term processes of adaptive management and planning, as well as to establish monitoring and evaluation indicators of both management and the conservation of biological and cultural diversity on the site. Likewise, site management plans must be articulated strategic plans of PA systems so as to ensure coordination and joint technical, operational and financial coordination among the PAS›s.
1.5 Preventing and mitigating the negative impacts of major threats to protected areas.	By 2008, effective mechanisms will have been established so as to identify and avoid or mitigate the negative impacts of serious threats to protected areas.	While studies have been advanced and major threats have been identified, analyzed and prioritized in terms of impact on the Amazon ecosystem as well as progress has been made in reviewing and dealing with status indicators (ecological integrity) and pressure, the region is still weak in defining, developing and implementing strategies to prevent or to mitigate threats, such as timely environmental impact assessments of projects on protected areas. The countries must also work together on defining legal liability and redressing measures, incorporating the «polluter pays» principle or other appropriate means in relation to damages to protected areas, as well as timely environmental impact assessments of plans and projects on protected areas, especially at the regional level. While studies have been advanced and major threats have been identified, analyzed and prioritized in terms of impact on the Amazon ecosystem as well as progress has been made in reviewing and dealing with status indicators (ecological integrity) and pressure. The region is still weak in defining, developing and implementing strategies to prevent or mitigate threats, such as timely environmental impact assessments of projects on protected areas. The countries must also work together on defining legal liability and redressing measures, incorporating the «polluter pays» principle or other appropriate means in relation to damages to protected areas, as well as timely environmental impact assessments of plans and projects on protected areas, especially at the regional level.

Strategic Action	Tasks	Term(years)		
		Short (1-4)	Medium (5-7)	Long (8-10)
Develop, strengthen and harmonize integrated management plans and protected areas management with a regional focus, with adaptive vision, long term and to also include the monitoring and evaluation systems for the management and handling, as well as biological and cultural diversity.	Coordinate and harmonize the planning of protected areas in relation to strategic plans and systems of regional sectoral initiatives based on the ecosystem approach		X	X
	Share experiences of planning and management methodologies to strengthen PA subregional planning initiatives that contribute to effective conservation and sustainable use of biodiversity at regional scale		X	X
	Develop models for management and planning of protected areas to strengthen regional level processes and to integrate protected areas into land use planning initiatives.		X	X
Progressing in regional processes of analysis, modeling, prevention and mitigation of impacts on the development of PA extractive activities, infrastructure, climate change, agricultural expansion and all other development activities	Designing and implementing training programs on impact assessment, monitoring plans, mitigation, strategic environmental assessments, etc.. to strengthen national and regional technical capacity.	X	X	
	Developing and agreeing on a rating system (indicators, variables, methods, models and scales of information) approved for the regional analysis of state and pressures on ecosystems and regional Protected Areas.	X	X	
	Developing arrangements for establishing regional monitoring for the various ongoing initiatives.	X	X	
	Supporting the creation of forums for communication and dialogue rather than progress of countries in relation to the study of the phenomenon of Climate Change: Scenario analysis, vulnerability, impacts, strategies and tools for mitigation, adaptation, etc. to jointly define technical strategies, operational and financial mitigation and adaptation in PA systems.	X	X	
	Making progress in technical cooperation processes for analysis and modeling of impacts on AP activities such as: i) mining, ii) exploration and exploitation of hydrocarbons, iii) infrastructure: hydro electric power, iv) unregulated hunting, v) disposal of waste urban centers and vi) fire in relation to CC and agricultural expansion	X	X	
	Progressing on subregional technical cooperation for the implementation of early warning systems and technical cooperation in areas that provide for the implementation of activities and high impact projects.	X	X	X
	Encouraging participation and social and corporate responsibility for the adoption of best practices in important areas which contribute to the conservation of biological and cultural diversity.	X	X	
	Strengthening the various mechanisms of control and monitoring of protected areas for conservation of biological biodiversity.	X	X	X
	Establishing mechanisms for the valuation of environmental goods and services on the importance of Amazonian protected areas as a strategy for biodiversity conservation and adaptation to CC.		X	X
	Promoting the implementation of Strategic Environmental Assessments (SEA) of policies, plans and programs of regional scope, as a strategy to prevent significant environmental effects.	X	X	X
	Analyzing the proposals from the Amazon countries which are being passed in relation to REDD, in order to facilitate the exchange of information and experiences.	X		
	Sharing information and methodologies related to the sustainable use of natural resources protected areas.	X	X	X

Synthesis and projections of the implementation of the programme of		
Element 2: Governance, participation		
Objectives	**Goals**	**Tasks Developed - Compliance**
2.1. To promote Equity and participation in benefits	Establishing by 2008 mechanisms for equitable sharing of both costs and the benefits arising from the establishment and management of protected areas.	Amazonian countries have made progress in establishing participatory processes in planning, administration as wellas management of protected areas. There is concrete experience of citizen›s participation in which states have formally recognized local participation in protected area management and they have made changes in environmental regulations both to widen participation and to enforce the formation of formal venues for local participation There are several forms of co-operation, co-management and consultation arrangements. However it is pertinent to further deepen on mechanisms of equitable participation of both costs and profits arising from the establishment and administration of the PA›s. Regionally, there has been progress in transnational processes of regional integration and cooperation to strengthen management capabilities and management of biodiversity and PA systems and achieve greater ecological representativeness, coverage and connectivity and improving governance.
2.2. To Intensify and to strengthen participation of indigenous and local communitites, as well as all pertinent stakeholders interested.	By 2008, full and effective participation of indigenous and local communities, while fully respecting their rights and recognizing their responsibilities, consistent with national laws and applicable international obligations, plus the involvement of other relevant stakeholders in the management of existing protected areas.	The general trend in the region is significant progress in terms of legal recognition of indigenous rights. This is reflected in the ratification of ILO Convention 169 and in the Amazonian state constitutions. The recognition of rights to land and ancestral territories of indigenous peoples has been one of the most important progresses made, since in most Amazonian countries titles have been given which recognize indigenous rights over extensive land areas. One of the main conflicts corresponds to the overlapping of a figure (PA) on the other (IT). Process continues to reach agreements as for deed issuing and the right to full ownership of indigenous territories on the grounds that their occupation was prior to any other occupation, and supported in the legal commitments of historical and international order that the States have undertaken. Progress in terms of new conditions for cooperation and dialogue between government representatives and indigenous communities is undeniable; the above is reflected not only on the greater incidence on decision making in the management and handling of PA›s, but also on the interest of some communities in their territories becoming part of national systems of Protected Areas.

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equity and share in benefits

Acción estratégica	Activities	Term(years)		
		Short (1-4)	Medium (5-7)	Long (8-10)
Studying, evaluating and promoting the involvement of different players, strategies, figures and tools for conservation and management of biological and cultural diversity and other natural resources to show alternatives that enable effective management and conservation of areas of biological, cultural and economic importance.	Progressing in participatory assessments, models and existing governance processes, formal or informal, to achieve the goals of conservation and development - with emphasis on transnational processes.	X	X	
	Establishing mechanisms for regional exchange of experience handling AP: shared management, best practices, forms of land tenure, lessons learned in terms of PA governance, etc.	X	X	
	Promoting capacity building processes that incorporate: i) diversity players with shared responsibilities and powers in the management of AP and ii) the skills demanded by new forms of governance (communication, negotiation, facilitation, coordination of actors, conflict management , etc.).	X	X	
	Sharing experiences about sustainable use and management of goods and services from biodiversity in protected areas and conservation areas, to help improve the standard of living of the populations living in these geographical areas.	X	X	
	Supporting initiatives for sustainable use and management of goods and services derived from biodiversity (ethnic tourism, ecotourism, etc.) Driven by indigenous and local communities in PAs.	X	X	
	Strengthening the capacities of institutions, indigenous, Afro-American communities and local transboundary protected areas for the protection of traditional knowledge, traditional practices and innovations for use and management in PA Biodiversity.	X	X	X
	Analyzing the different mechanisms and incentives promoted by the Amazon countries for the management and conservation of private protected areas, to identify common tools that contribute to the Sustainability of this figure of regional protection.	X	X	X
Sharing experiences to facilitate and strengthen participatory processes and communication with local communities, indigenous populations and populations of African descent, as well as other actors involved in the creation, management and planning of protected areas.	Supporting assessment and experience sharing tasks on efficacious means for participation of stakeholders interested in crating adn jointly managing conservation undertakings and, in general, governance - related undertakings in Protected Areas.	X	X	X
	Generating processes in strengthening local capabilities and institutional arrangements for administration and management of protected areas.	X	X	X
	Systematizing and exchanging experiences on processes involving all stakeholders in the monitoring of development projects which have an impact on protected areas and lands of indigenous and local communities.	X	X	X

Synthesis and projections of the implementation of the programme of		
Element 3: Favorable		
Objectives	**Goals**	**Tasks Developed - Compliance**
3.4. To ensure financial sustainability of protected areas and national and regional systems of protected areas.	By 2008, sufficient resources to cover the costs of implementing and effectively managing national and regional systems of protected areas shall be obtained, both from national and international sources.	Progress was made in a preliminary analysis of AP Financial Sustainability of regional scale, which should be strengthened in the context of strengthening the process of building the vision of conservation of the Amazon Biome. Amazon countries have made progress in their analysis and assessment of financial viability from the score sheet developed by UNDP. According to regional analys, it has been found that the state is the main source of income for PAs in the region with a 74%, followed by international cooperation by 18%. Self management income is only 8% of the resources available and is mostly generated by way of the entrance fee to the AP. This allows suggesting a diversified portfolio of sources of income for conservation, so as to ensure long-term resources and not depend on too unstable sources. It ils estimated that investments have been made for about U.S. $ 200 million in the consolidation of protected areas in the Amazon region; such ivestment includes expenditure on infrastructure, equipment, management plans, among others. However there is a gap in investment of about $ 500 million for all of these protected areas to reach minimum levels of management effectiveness. It was also estimated that the annual demand to cover the recurrent costs of protected areas in the biome, after the minimum investments made to cover the financial gap mentioned above, will be approximately $ 250 million. Currently, the joint annual budgets of the Amazon countries are close to 40% of this value.

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Activities

Strategic Action	Activities	Term(years)		
		Short (1-4)	Medium (5-7)	Long (8-10)
Developing a comprehensive analysis at regional level (based on estimates and tools implemented by countries) on financing needs and on defining and managing a regional strategy for financial sustainability for protected areas of the Amazon biome.	Consolidating a standardized regional information protocol for financial sustainability, considering the experiences as of ACTO or Ministry of Environment of Brazil and jointly analyzing regional information needs and gaps.	X		
	Carrying out studies to incorporate environmental variables in the national accounts.	X	X	X
	Performing systematic economic valuation exercises, emphasizing on ecosystem services, at Amazon biome scale, showing the profits and the economic contribution to regional development.	X	X	
	Identifying and managing sources and financial mechanisms for sustainable management of protected areas in the biome.	X	X	
	Advancing in systematizing, studies and exchange of experiences and training, to include in the systematic planning of the subject areas of financial sustainability.	X	X	
	Performing periodic upgrades, evaluations and systematization of information on the analysis of financial sustainability in the Amazon region using score sheets of financial sustainability and other appropriate instruments to conduct regional analysis.	X	X	
	Generating training process on the issue of financial sustainability and implementation of tools through REDPARQUES platform, aimed at government officials and staff working in PA's	X	X	
	Analyzing, systematizing and documenting lessons learned and regional financial mechanisms that could contribute to the financial sustainability of protected areas in the Amazonian biome.	X	X	X

Synthesis and projections of the implementation of the programme of		
		Element 4: Regulations,
Objectives	**Goals**	**Tasks Developed - Compliance**
4.2. Assess and improve the effectiveness of protected area management.	By 2010, frameworks for monitoring, assessing and reporting related to the effectiveness of site management and national and regional systems of protected areas as well as cross border protected areas shall be adopted and implemented by the Parties.	The Amazon countries have developed, adapted and implemented several tools for monitoring and evaluating the management effectiveness of protected areas. In regional systems of protected areas, venues should have been created in order to advance towards common methodological frameworks for assessing management effectiveness of the surrounding areas, based on the experiences of the developed countries and international instruments that have been proposed for this end. The assessment tasks performed have contributed to the updating and collection of baseline information on the Protected Areas and to highlight threats to the values of place, weaknesses in management and in some countries that have management plans. These assessment tasks help update and adjust those plans and help in establishing a continuous process of monitoring and of assessment of decision making process, regarding handling and management of PAs.

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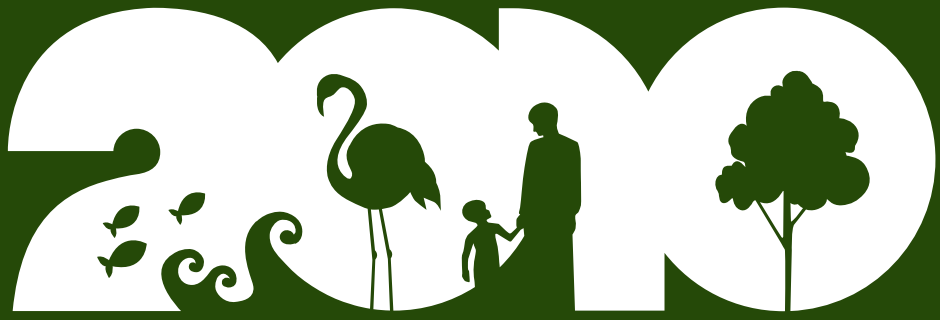
assessment and supervision

Strategic Action	Activities	Plazos (años)		
		Corto (1-4)	Mediano (5-7)	Largo (8-10)
Advancing in the learning process, concepts, information exchange and systematization and analysis of results of EEM at different scales, identifying strengths and weaknesses that contribute to effective management of protected areas in the Amazonian biome.	Promoting capacity - building activities to ensure that the 9 countries of the region manage to achieve and to institutionalize the analyses of management›s effectiveness on their protected areas, so as to have a full regional scenario.		X	
	Developing a standardized protocol for sharing information on evaluation of management effectiveness of protected areas.	X		
	Coordinating with RedLAC other funding sources in order to promote support for the activities of monitoring and evaluation of management effectiveness of protected areas.	X		
	Strengthening effectiveness analysis processes and their subsequent incorporation in the process of planning, management and operation of each country by means of the exchange of experience and training.	X	X	X
	Advancing in development process of pilot management effectiveness in border areas, strengthening the management plans.	X	X	
	Performing analysis of management effectiveness of PA systems integrating the elements which characterize the financing system.		X	
	Considering the MA processes at the regional level or other issues that are gaining interest, as are the certification of protected areas and the implementation of ecological corridors.			X
	Generating a process of study and of learning to integrate the cultural issue in the analysis of effectiveness according to the needs of each country.	X	X	X
	Promoting regional workshops with staff of institutions responsible for protected area by management effectiveness, in order to review their tools and to develop indicators as wellas variables that cover missing elements of the Reference Framework for Management Effectiveness of WCPA, specifically Context, Products and Results and adapt to regional scale.	X		
	Supporting the analysis that correlates the results of effectiveness of management governance variables and categories of protected area management.			X

Please inform:
The names, IUCN category, perimeter (km) and extension (in hectares) of protected areas of the country in the Amazon basin.
The total budget for the national system of protected areas, including public funds, what is collected (which comes from concessions, tickets and other visitors), donations and other sources in the years 2008, 2009 and 2010. If possible, estimate the budget for the protected areas of the Amazon region.
Current staff in the areas (dedicated workforce), including state officials, community, or contracted dealers.
An estimate of the maximum hectares per person to allow a minimum effective management of the area.
Which areas have management plan and management board or like instruments.
Estimating a pyramid functionalstructure, being the basis of field-level people. To do this, determine i) the number of top level people per 10 people at the field level, ii) the number of mid-level people per 10 people at field level.
Estimate costs of key supplies and input for the management of protected areas (tab «Cost»)

Estimate cost of basic supplies and input for the management of protected areas
Costs (US$)
Upper Level Salary (Yearly)
Mid Level Salary (Yearly)
Field Level Salary (Yearly)
4x4 Vehicles (Unit Value)
Engine boat with cover (Unit value)
Fuel – diesel (price per liter)
Fuel – gasoline (price per liter)
Control Headquaters (Building cost)
Management Infra-structure (headquarters) of the protected area (construction value)
Management Plan (Eleboration cost)
Estimate of common yearly expenditure at site
Estimate of common yearly expenditure at central office



2010 International Year of Biodiversity

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Brazil's Environment Ministry

Libertad y Orden
República de Colombia
Ministerio de Ambiente, Vivienda y Desarrollo Territorial

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