Specific Objectives:

16.4.1. To strengthen existing funds for financing the administration and management of biodiversity.

16.4.2. To encourage the creation of investment funds for the administration and management of biodiversity, including encouraging the participation of the business sector.

16.4.3. To support studies directed at the creation of a fiduciary fund, or other equivalent mechanisms, able to guarantee the financial stability necessary for the implementation and maintenance of protected areas, including land purchase.

16.4.4. To encourage the creation of funds and/or other mechanisms, managed in a participatory way by Indigenous populations, *quilombolas* and other local communities, which promote the just and equitable sharing of benefits, monetary or otherwise, resulting from access to genetic resources, components of the genetic patrimony and the associated traditional knowledge.

16.4.5. To strengthen actions in favour of biodiversity by research funding agencies in all states.

16.4.6. To promote mechanisms to secure the planning and application of budgetary and other financial resources for the administration and management of biodiversity.

16.4.7. To encourage the creation of financing mechanisms by research funding agencies which are dedicated to the implementation of research plans and administration and management of biodiversity in and around protected areas.

16.4.8. To encourage the creation of funds for cooperative enterprises and for small to medium sized rural producers that use biodiversity resources sustainably.

16.4.9. To encourage the participation of the private sector through investments in administration and management of the country's biodiversity.

16.4.10. To encourage the creation of economic and fiscal mechanisms that encourage the business sector to invest in surveys and research on the conservation and sustainable use of biodiversity in the country, in partnership with research institutions and the public sector.

16.4.11 To foster the conservation and sustainable use of biodiversity in private properties through economic incentives.

16.5. Fifth Directive: International Cooperation. The promotion of international cooperation regarding the administration and management of biodiversity with the strengthening of international juridical acts.

Specific Objectives:

16.5.1. To strengthen the preparation and participation of Brazilian delegations in international negotiations related to biodiversity themes.

16.5.2. To promote the implementation of international agreements and conventions related to the administration and management of biodiversity, with special attention given to the Convention on Biological Diversity and its programmes and initiatives.

16.5.3. To establish synergies directed at the implementation of the environmental conventions signed by Brazil.

16.5.4. To support the negotiation of just accords and agreements beneficial to the country, for the exchange of knowledge and transfer of technology with international and foreign research centres.

16.5.5. To strengthen international cooperation in research, programmes and projects related to knowledge and the administration and management of biodiversity, accruing value to its components, in conformity with the directives in Component 5.

16.5.6. To support the participation of national research centres in international research networks, the development of technologies and programmes related to knowledge and biodiversity management.

16.5.7. To identify and encourage the use of mechanisms included in international agreements that can benefit the conservation and sustainable use of biodiversity, including the use of the Clean Development Mechanism.

16.6. Sixth Directive. Strengthening of the Legal Framework and Integration of Sectoral Policies. The promotion of actions directed at strengthening Brazilian legislation on biodiversity, and to the articulation, integration and harmonization of sectoral policies.

Specific Objectives:

16.6.1. To promote a survey and evaluation of the entire normative framework relative to biodiversity in Brazil in order to propose suitable adjustments for the administration and management of biodiversity.

16.6.2. To consolidate Brazilian legislation about biodiversity.

16.6.3. To promote the articulation, integration and harmonization of sectoral policies that are relevant to biodiversity conservation, the sustainable use of its components and the sharing of benefits derived from the use of genetic resources, components of the genetic patrimony, and the associated traditional knowledge.

17. INSTITUTIONAL JURIDICAL FRAMEWORK

17.1. Many ongoing institutional initiatives in Brazil relate to the deliberations of the Convention on Biological Diversity (CBD) and to the directives and objectives of this National Biodiversity Policy. Plans, policies and sectoral programmes need to be integrated in order to avoid duplication or conflict. The National Biodiversity Policy requires the strengthening or creation of participatory mechanisms to articulate the acts of society in favour of the objectives defined by the CBD. The implementation of this policy depends on various sectors and ministries of the Federal Government, the Federal District, and the state and municipal governments and civil society according to their legal competencies and attributes.

17.2. Given the group of players and public policies that, directly or indirectly, have a vested interest in the administration and management of biodiversity and, therefore, in the commitments assumed by Brazil to implement the CBD, the implementation of the Policy must lead to the creation or strengthening of institutional arrangements that guarantee legitimacy and sustainability in complying with the CBD objectives, in terms of the conservation and sustainable use of biodiversity and the just, equitable sharing of the benefits that result from its use.

17.3. In implementing the National Biodiversity Policy, the Ministry of the Environment is responsible for:

a) Articulating the actions of the National Biodiversity Policy with the *Sistema Nacional do Meio Ambiente – SISNAMA* [National Environment System – SISNAMA] along with other government sectors and civil society;
b) accompanying and evaluating the execution of the components of the National Biodiversity Policy and preparing national reports about biodiversity;
c) monitoring, including the use of indicators, the execution of actions foreseen in the National Biodiversity Policy;
d) formulating and establishing programmes and projects to support the execution of the actions foreseen in the National Biodiversity Policy and proposing and negotiating financial resources;
e) articulating with the other Ministries relevant for the themes involved, and submitting proposals for the creation or modification of legal instruments necessary for the proper execution of the National Biodiversity Policy;
f) promoting the integration of sectoral policies to increase synergy in actions for implementing the sustainable administration and management of biodiversity (conservation, sustainable use and benefit sharing), avoiding conflicts among them; and
g) encouraging inter-institutional and international cooperation to improve the implementation of actions for the administration and management of biodiversity.

17.4. The implementation of the National Biodiversity Policy requires a collegiate jurisdiction to guarantee compliance with the interests of this National Biodiversity Policy at the Federal Government level, defend the decentralization of the actions performed and guarantee the participation of interested sectors.

17.5. This collegiate jurisdiction will also be responsible for guaranteeing that the principles and objectives of the National Biodiversity Policy are fulfilled, providing technical assistance to the public and private agencies responsible for the execution of their components within the national territory.

17.6. The *Programa Nacional da Diversidade Biológica – PRONABIO* [National Biodiversity Programme – PRONABIO], instituted by Decree No.1354, 29th December, 1994, will coordinate and implement the National Biodiversity Policy, by promoting partnerships between government and civil society for the understanding and conservation of biodiversity, the sustainable use of its components, and the just and equitable sharing of the benefits derived from its use.

Chapter 6

EVALUATION OF PRIORITY AREAS AND ACTIONS FOR THE CONSERVATION, THE SUSTAINABLE USE AND THE SHARING OF BENEFITS IN THE BRAZILIAN BIOMES - NATIONAL SYNTHESIS

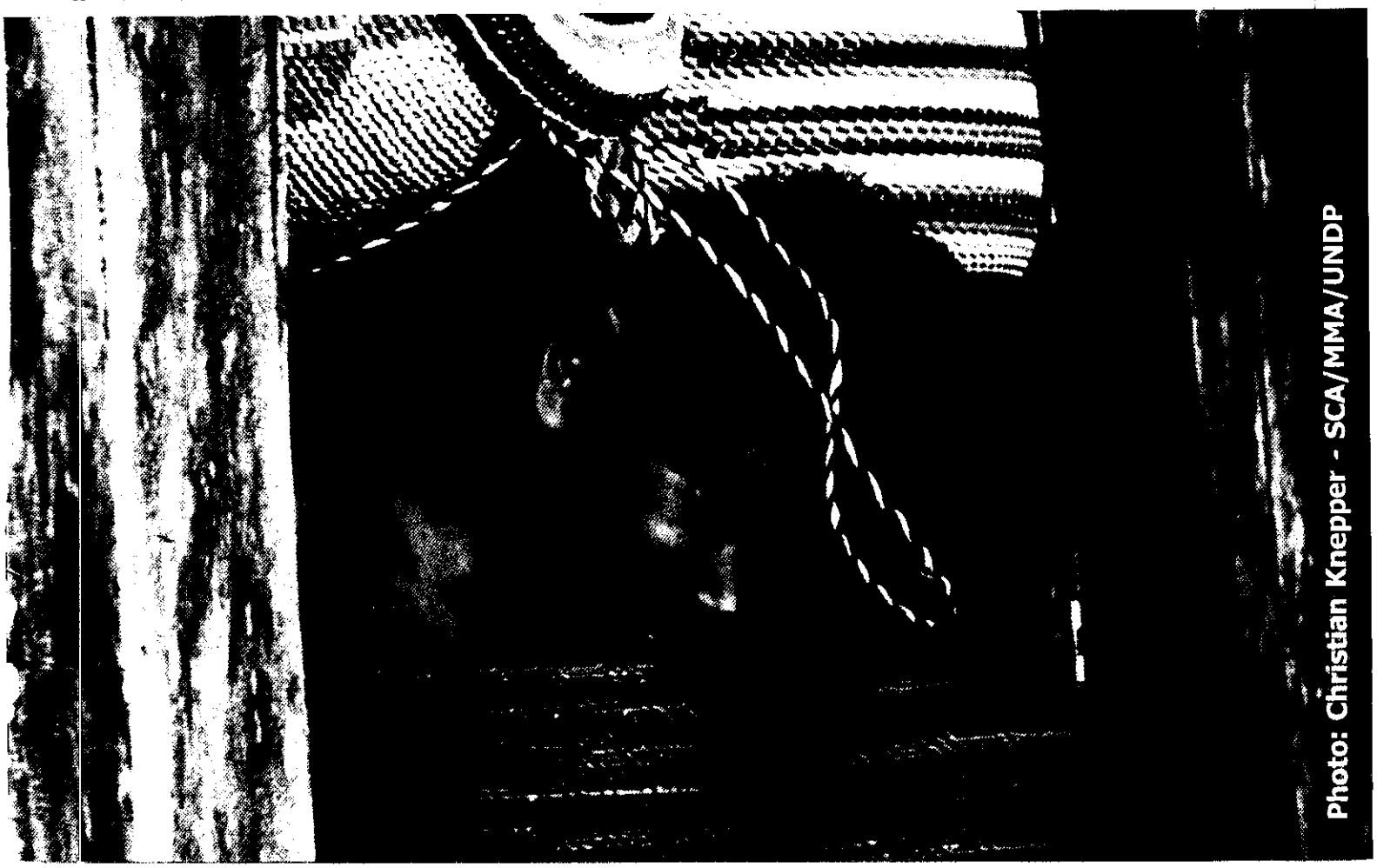


Photo: Christian Knepper - SCA/MMA/UNDP

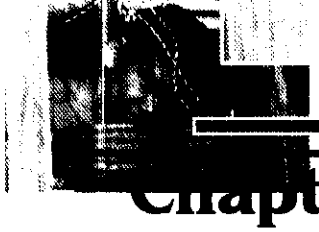
Evaluation of Priority Areas and Actions for the Conservation, Sustainable Use and Sharing of Benefits in the Brazilian Biomes - National Synthesis

Introduction

Five consultative workshops were held over three years, 1998-2000, in order to identify and prioritise areas for conservation in each of the major biomes in Brazil: Amazon; the Atlantic forest and Campos Sulinos (southern grasslands); the Caatinga (xerophytic thorn scrub and forest of the North-east of Brazil); the Cerrado (sclerophytic bush savannah of central Brazil and parts of Amazon) and the Pantanal (wetlands of the upper Rio Paraguay basin); and the coastal and marine ecosystems of the Atlantic (Table 4). Each workshop employed the expertise of numerous academics, researchers, and conservationists, besides representatives of appropriate regional and national government and non-governmental organizations. Data on biodiversity, socioeconomy and land use were compiled prior to each workshop, which culminated in the identification of priority areas and practical recommendations for measures to promote their conservation, taking into account the current and projected social conditions and economic and developmental scenarios. While most of the priority areas were identified as a result of varying degrees of understanding of the biodiversity they contain, a large number were also chosen because of their potential importance but an almost complete lack of biological information. Nearly 18% of the priority areas in the Caatinga, the Atlantic forest and the Campos Sulinos were classified as of "insufficient knowledge". The need for inventories and biological surveys arose as a recurrent recommendation for the large majority of the marine and coastal priority areas. The identification of these poorly known areas was recognized as an important result in itself.

Table 4. Workshops promoted by the Ministry of the Environment to identify priority areas and measures for the conservation of biodiversity in the major Brazilian biomes.

Biome/Workshop	Date	Place	Organization
Atlantic forest and southern grasslands			
Evaluation and Priority Actions for the Conservation of Biodiversity in the Atlantic Forest and Southern Grasslands	August 1999	Atibaia, São Paulo	Conservation International do Brasil; Fundação SOS Mata Atlântica; Instituto de Pesquisas Ecológicas – IPÊ; Fundação Biodiversitas; Secretaria do Meio Ambiente do Estado de São Paulo – SEMAD/SP, Instituto Estadual de Florestas – IEF/MG
Amazon			
Biodiversity in the Brazilian Amazon – Evaluation and the Identification of Priority Areas for Conservation, Sustainable Use and Sharing of Benefits	September 1999	Macapá, Amapá	Instituto Socioambiental – ISA; Instituto de Pesquisa Ambiental da Amazônia - IPAM; Conservation International do Brasil; Grupo de Trabalho Amazônico - GTA; Instituto Sociedade, População e Natureza - ISPN; Instituto do Homem e Meio Ambiente da Amazônia - IMAZON
Coastal Zone and Marine			
Evaluation and Priority Actions for the Conservation of Biodiversity in the Coastal and Marine Zones	October 1999	Porto Seguro, Bahia	Fundação BIO-RIO; Secretaria do Estado de Ciência, Tecnologia e Meio Ambiente – SECTAM/PA; Instituto de Desenvolvimento Econômico e Meio Ambiente do Rio Grande do Norte – IDEMA/RN; Sociedade Nordestina de Ecologia – SNE/PB; Secretaria do Meio Ambiente do Estado de São Paulo – SMA/SP; Fundação Estadual de Proteção Ambiental Henrique Luis Roessler – FEPAM/RS
Caatinga			
Evaluation and Priority Actions for the Conservation of Biodiversity in the Caatinga Biome	May 2000	Petrolina, Pernambuco	Universidade Federal de Pernambuco / Fundação de Apoio ao Desenvolvimento; Conservation International do Brasil; Fundação Biodiversitas; EMBRAPA Semi-Árido
Cerrado and Pantanal			
Priority Actions for the Conservation of Biodiversity in the Cerrado and Pantanal	March 1998	Brasilia, DF	Fundação Pró-Natureza - FUNATURA; Conservation International do Brasil; Fundação Biodiversitas; Universidade de Brasília



Chapter 3

1. Priority areas

The five workshops resulted in the identification of 900 priority areas nationwide for the conservation and sustainable use of biodiversity. Of these, 43% are in the Brazilian Amazon, 20% in the Atlantic Forest and Campos Sulinos; 18% in the Coastal and Marine Zones; 10% in the Cerrado and Pantanal, and 9% in the Caatinga. Three criteria were used to rank the relative importance of the priority areas: (A) Extreme biological importance; (B) Very high biological importance; and (C) High biological importance. A fourth category, (D), was "Insufficiently known, but of probable biological interest".

The Macapá Workshop resulted in 385 priority areas for the conservation and sustainable use of the biodiversity in Legal Amazon. Of these: 247 were classified as of extreme biological importance, 107 of very high importance, eight as of high importance, and 23 as poorly known, but of probable biological importance. A total of 82 priority areas were identified in the Caatinga. Twenty-seven were classified as areas of extreme biological importance, 12 as areas of very high importance, 18 as of high importance and 25 as insufficiently known. Of the 182 priority areas identified for the Atlantic Forest and Campos Sulinos, 99 were classified as of extreme biological importance, 35 as of very high importance, 26 as of high importance, and 22 as insufficiently known. Evaluation of the Cerrado and Pantanal produced 87 priority areas; 47 of extreme biological importance, 16 of very high importance, 12 of high importance, and 12 were considered insufficiently known. Lastly, the coastal and marine biomes' workshop identified 164 priority areas for biodiversity conservation: they include nine major areas in the north, from Amapá to Maranhão, each with sub-areas with specific recommendations; 47 areas in the north-east from Piauí to Bahia; 37 in the south-east from Espírito Santo to Paraná; 40 in the south (Santa Catarina and Rio Grande do Sul); and 31 for the continental platform and oceanic islands. In fifty areas the classification was either "insufficiently known" or recommendations included the need for biological inventories.

Overall, 510 areas were considered as of "extreme biological importance", 214 as of "very high biological importance", 77 of "high importance", and 99 as "insufficiently known but probably of high biological importance" (Table 5).

Table 5. Importance rating of priority areas per biome.

	Amazon	Caatinga	Cerrado Pantanal	Atlantic Forest and Southern Grasslands	Marine and Coastal Zones	Total
Extreme biological importance	247 64%	27 33%	47 54%	99 55%	90 55%	510 57%
Very high biological importance	107 28%	12 15%	16 18%	35 19%	44 27%	214 24%
High biological importance	8 2%	18 22%	12 14%	26 14%	13 8%	77 8%
Insufficiently known, but probably of high biological importance	23 6%	25 30%	12 14%	22 12%	17 10%	99 11%
TOTAL	385	82	87	182	164	**900**

The main recommendations for action in the priority areas were ranked in a scale from "0" (not recommended) to "5" (priority). In the Amazon workshop, the results were as follows: in 39.2% of the areas the chief priority suggested was the sustainable use of natural resources; in 24.9%, measures to improve the protection of the area; in 20.8%, the creation of a protected area; in 14% the need for research; and in only 1%, the need for restoration. For the Caatinga, the principal action recommended for the majority of the priority areas (54,8%) was strict protection. This measure was recommended for 81% of the areas of extreme biological importance, 75% of the areas of very high biological importance, and 72% of the areas of high biological importance. By contrast, and as one would expect, the main action recommended for the majority of the areas considered insufficiently known (96%) was scientific research. For the most of the areas, the actions recommended were urgent (43,9%), or necessary in the short- (30,5%) or medium-term (25,6%).

Priority areas were assigned to approximately 33% of the Atlantic forest, and more than half (nearly 55%) were classified as of extreme biological importance. Biological inventories and issues concerning protected areas (creation, management, amplification, and change in category) were the most frequently suggested recommendations. The creation of protected areas was the single measure most frequently recommended by the specialists at the workshop; nearly half of the priority areas. This outcome reflects the urgent need to protect the last remnants of the Atlantic forest and the Campos Sulinos, and the recognition that protected areas are the single most important tool available to achieve this.

For the Coastal zone, recommendations for 128 of the priority areas included the creation of protected areas of sustainable use (direct use), besides the amplification, change in status, or resolution of landownership, and the effective management and protection of existing protected areas. Excluding the priority areas recommended for the creation of reserves or parks, restoration was the measure suggested for 18 priority areas - in metropolitan regions, lakes and bays.

2. Recommendations

The results of the workshops converged in a number of their overall recommendations and, as such, contribute significantly to the establishment of environmental policies and to the National Biodiversity Strategy. They are essentially concordant with the objectives of the Convention on Biological Diversity – CBD, established by Decree No. 2,519, of March 16th, 1998: "...the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding."(Article 1 - Objectives).

The recommendations from the five workshops are summarized below under the following headings: Conservation Strategies, Administration of Public Policies for Biodiversity Conservation, Environmental Education, Financing and Economic Incentives of Conservation, Research and Training, and the Sustainable Use of Resources.

2.a. Conservation Strategies

2.a.1. Protected Areas / Conservation Units

In all of the workshops except that for Amazon, the creation of protected areas, or "Conservation Units" as they are referred to in Brazil, was the most frequent recommendation for the priority areas identified. The need for biological inventories was second in this respect. The following general recommendations were given regarding protected areas:

1. Increase the value attributed to protected areas as a conservation tool;
2. There is urgent need to resolve the principal existing challenges facing the effective maintenance and management of protected areas; and
3. The need to create more protected areas.

Suggestions concerning item 1 were as follows:

- Always stress that the principal role of any protected area is to protect the environment;
- strengthen the role of protected areas as a nucleus for more widespread measures for conservation and sustainable use which are replicable in other areas; and
- Emphasize the complementary role of the protected area in supporting training and the implementation of sustainable resource use by the surrounding communities.

The commonest challenges identified regarding the maintenance and management of protected areas (item 2) were:

a) Unresolved landownership

Recommendations:

- Create an exchange system with landowners in the protected areas, trading their properties for land elsewhere lacking ownership (*terras devolutas*), besides providing indemnities;
- adapt the legislation for the licensing of public works which involve environmental impacts so as to allow for the use of settlements originating from environmental compensation to resolve landownership in existing protected areas, as well as to increase their size;
- study the possibility of creating environmental debt titles, generating resources that could be used to indemnify landowners in protected areas (similar to the agrarian debt titles applied in colonization settlements);
- evaluate the possibility of exchange or sale of public estate to help finance the regularization of landownership;
- in the case of conflict with indigenous lands, create working groups for the stakeholders, including the National Indian Foundation (Fundação Nacional do Índio – FUNAI), the Brazilian Institute for the Environment (IBAMA), and the indigenous groups involved;

- for traditional communities: carry out a diagnostic survey of conflicts with protected areas and organize public meetings and seminars to discuss and resolve them.

b) Lack of financial resources

Recommendations:

- Establish partnerships and collaborative agreements between federal, state and municipal institutions and civil society, with well-defined roles;
- annual meetings of those responsible for protected areas for combined financial and budgetary planning;
- incentives for a policy decision attributing more federal and state funds for the creation, maintenance and management of protected areas;
- provision of financial incentives, such as the Green Tax on the Circulation of Goods and Services (*Imposto sobre Circulação de Mercadorias e Serviços – ICMS*), for municipalities and states which have strictly protected areas within their jurisdiction;
- feasibility study for the creation of trust funds or similar mechanisms to guarantee financial stability for the creation and maintenance of protected areas; and
- Consideration of the extent of protected areas within municipal districts as an additional criterion for allocation of the Municipal Participation Fund (*Fundo de Participação dos Municípios– FPM*).

c) Functioning / inadequate reserve management and protection

Recommendations:

- Increase the human resources available for the management and maintenance of protected areas;
- develop and implement dynamic management strategies appropriate for each protected areas;
- provide norms for, encourage, implement and evaluate diverse mechanisms of cooperation for the management and maintenance of protected areas;
- strengthen cooperation between government and non-governmental organizations (NGOs) for the management and maintenance of protected areas;
- encourage and promote environmental education and sustainable development practices with local populations;
- create economic opportunities of low environmental impact for local populations in the vicinity of protected areas, so as to minimize impacts and invasion;
- strengthen the public institutions which manage protected areas, by increasing the number of staff and through training;
- strengthen non-governmental organizations currently working in protected areas;
- Recommend support for the creation of specific government departments for the management and maintenance of protected areas, at all levels. The Support Committee for the Management of Protected Areas and the experience of the state of São Paulo are good examples.

d) Research in Conservation Units – inadequate or lacking

Recommendations:

- Promote the creation of an integrated biodiversity monitoring and research programme in protected areas;
- draw up research plans and guidelines for protected areas;
- create specific financing mechanisms through science research funding organizations to implement research in, and for, protected areas;
- develop training programmes for local communities to collect data and monitor biodiversity in protected areas;
- create a minimum protocol for the collection, and institutionalisation through electronic databases, of abiotic, biotic, social and institutional information on protected areas;
- disseminate information on protected areas in terms accessible to the general public (local, regional, national and international) and develop initiatives to give greater value and priority to protected areas; and
- use the results of the workshops to prioritize research in protected areas.

e) Subsistence hunting

Recommendations:

- Provide incentives for community fish farms and captive breeding projects (cooperatives) for certain game animals (for example: collared peccary *Tayassu tajacu*, cavy *Cavia* sp., Eared Dove *Zenaida auriculata*, mocó *Kerodon rupestris*, and Rhea *Rhea americana*);
- environmental education programmes to stimulate the conservation and sustainable use of natural resources;
- organize workshops and seminars on environmental legislation, with the participation of the local Judiciary and Executive authorities (including registrars), sponsored by such as the Ministry of Environment, state and municipal governmental secretariats, and civil NGOs for environmental advocacy;
- identify alternative income and protein sources, providing training and capital for appropriate community projects in such as apiculture using native species, horticulture and communal nurseries for ornamental and medicinal plants; and
- develop the means to improve the control and elimination of illegal activities, and training for such as fiscal authorities, forest police, and park guards.

f) Deforestation and firewood

Recommendations:

- Provision of incentives for alternative energy sources (solar, eolic, biodigestors);
- establishment of appropriate management regimes in National Forests (FLONAs) and Areas of Environmental Protection (APAs) for the sustainable supply of firewood (excepting areas where there are threatened or endemic species); and
- creation of National Forests in areas where there is particularly intensive and destructive use of the natural vegetation, to control predatory activities and establish alternative and sustainable uses of the resources.

g) Fires

Recommendations:

- Develop programmes to encourage environmentally friendly agricultural practices (sustainable) in the vicinity of protected areas;
- adopt preventative measures against fire, and awareness campaigns to avoid its use in agriculture, or, where appropriate, to carry out the correct procedures for its control; and
- efficiency in the monitoring and control of fire in protected areas, making the local communities aware of the damage and destruction it can cause.

Suggestions concerning the creation of new protected areas (item 3) were:

- Establish more robust mechanisms and procedures for researching the appropriateness of the establishment of a given category of protected area in a particular region, taking into account the biodiversity and natural landscapes involved and the regional and local context, and for the careful planning of measures for its ecological viability (size, buffer zones, connectivity, and the incorporation of critical areas);
- carry out gap analyses and studies of complementarity for the current protected areas system so as to obtain significant representation of the vegetation types and biodiversity (particularly threatened and restricted range species) which characterize the biomes, and designing systems which allow for dispersal and gene flow among populations;
- reinforce institutional collaboration and alliances to promote the creation and long-term viability of protected areas; and
- follow the recommendations of the workshops with regard to the setting of new protected areas.

More general recommendations were made with regard to the structuring of the National Protected Areas System (*Sistema Nacional de Unidades de Conservação – SNUC*):

- Formation of a coordinating committee with representatives from the three levels of government, environmental organizations, universities, research institutes, research funding agencies, public sectors (such as those for tourism and water resources), and NGOs with expertise in biodiversity, environmental protection, research, technical assistance and social issues;
- establishment of a website for information on protected areas;

- establishment of a discussion and support network; and
- formation of appropriate financial mechanisms.

Specifically for the Coastal and marine zones, recommendations included:

- The development of a specific conceptual, methodological and legal/regulatory framework for Marine Protected Areas; and
- the urgent need to prioritize the definition and siting of areas off-bounds for fishing, vital for stock replacement and, consequently, any approximation to sustainable fisheries, in the creation and/or planning of marine and coastal protected areas, as exemplified by those already established in the management plans of some Areas of Environmental Protection (APA) and Marine Extractivist Reserves (RESEX).

For Private Natural Heritage Reserves (*Reserva Particular do Patrimônio Natural - RPPN*), recommendations were as follows:

- Improvement of the quality of the programme;
- review the legislation to examine ways in which it can attract more interest from private landowners;
- increase public awareness of the advantages of creating private reserves;
- be more proactive in promoting them;
- stimulate the creation of state programmes for private reserves;
- increase the number of staff in the institutions responsible for the programmes;
- increase fiscal incentives to invest in RPPNs;
- encourage municipalities to provide for official registration of the reserves; and
- create a support programme for the owners of RPPNs to encourage conservation measures and provide technical expertise for the development and execution of management plans.

2.a.2. Restoration / use of degraded areas

The following recommendations were made concerning the restoration and use of degraded natural areas:

- Recognition of the importance of restoring degraded areas to re-establish forest ecosystem functions and, the important role of these areas as buffer zones for the protection of the forests through the development of appropriate economic activities;
- restoration and economic use of degraded areas through forest management - agro-forestry systems and reforestation, for example, to create a "green belt" to contain currently unsustainable trends of agricultural expansion;
- future colonization programmes should be focused on already deforested areas which, in many of cases, already have adequate infrastructure for basic social and environmental needs;
- cooperation among federal, state and municipal governments, credit agencies, and the appropriate training and research institutions is essential for the development of economically, socially and environmentally sustainable activities in degraded areas;
- restoration of Areas of Permanent Preservation (as defined in the Forest Code, Law 4,771 of 15 September 1965), and including, for example, river margins, springs, and steep slopes and hill tops) which have been destroyed;
- basic concepts that should underlie the economic use of degraded areas are: emphasis on products with aggregated value; equality and fairness in income distribution; value given to local actions; the diversification of local products; and improvement in the living conditions of local communities;
- establishment of a system for the monitoring and permanent control of land use in areas which are protected and undergoing restoration; and
- a restoration programme for the conservation of gallery forests, headwaters, and springs.

A suggestion was made for a new category of protected area specifically for areas seriously affected by desertification in the Caatinga: the "Area of Environmental Restoration".

A number of recommendations arose with regard to the restoration and management of areas suffering desertification:

- Elaboration and implementation of a National Plan for Desertification;
- refine and update indicators for the diagnosis of desertification;
- monitor areas undergoing desertification;
- create emergency programmes for the isolation of areas which have undergone desertification, and promote their restoration with incentives for economically productive activities;
- map the remaining fragments of primary vegetation;

- evaluate the degree of ecological integrity of the various landscapes and ecosystems classified as semi-arid;
- promote meetings, courses and training programmes on methods to combat desertification;
- register public and private institutions interested participating in the programme for combating desertification, and establish mechanisms for their integration and collaboration;
- study production chains in areas likely to suffer desertification, and mobilize the actors to carry out measures to make them more socially and economically attractive;
- provide incentives for reforestation, targeting species which are threatened;
- divulge and provide technical support for new or modified technologies;
- establish and define responsibilities for the control/elimination of illegal activities which promote desertification;
- increase research on environmental impacts in the Brazilian semi-arid region, dealing especially with areas impacted by mining, the management and conservation of soils and water, the management of saline and alkaline soils, water basin management, forest management and biodiversity conservation;
- full compliance with the findings and recommendations of environmental impact reports (Environmental Impact Assessments and Reports – EIA/RIMA), assuming all the technical responsibilities for any and all development projects as demanded by the legislation;
- reforestation with threatened species, transforming the areas into seed banks for conservation *in situ*;
- promote the use of new technologies developed by research institutions which help in combating desertification; and
- creation of databases pertinent to the subject, to facilitate the development and adoption of new understanding and technologies.

The following suggestions were put forward as activities needed to promote the restoration and productive use of degraded areas in the Amazon: Agro-forestry Systems; extractivism/handicraft businesses; small-scale, family-based agriculture; silviculture; reforestation, intensive farming and animal breeding, appropriate management of cattle farms, nature and ecotourism, aquaculture.

2.a.3. Indigenous Lands

The conceptual framework for conservation in Amazon must:

- Include indigenous lands, federal, state and municipal protected areas of direct and indirect use, and strategies for the sustainable use of natural resources;
- conclude the identification and demarcation of Indigenous lands;
- set up a specific legal framework for the protection of biodiversity in Indigenous lands which is compatible with the exclusive rights of the Indians concerning its use, but appropriate in terms of the special significance of the biodiversity and the landscapes involved;
- extend the application of the legal institution of protection to the areas surrounding protected areas and Indigenous lands;
- create working groups with representatives from the Brazilian Institute for the Environment and Renewable Natural Resources (IBAMA/MMA) and Indigenous communities to negotiate, case by case, solutions to the current overlap between some Indigenous Territories and strictly protected areas;
- review (by law or decree) the legislation which has created National Forests which overlap with Indigenous Lands;
- support the indigenous peoples occupying land included in the areas which have emerged as priorities for biodiversity conservation, in demarcating the lands recognized by them as of ethnic and cultural significance;
- promote and support projects, both technically and financially, by indigenous communities for the sustainable management and conservation of natural resources on their lands;
- formulate and implement biodiversity research programmes between indigenous communities and scientific research institutions;
- establish, under the coordination of the Ministry of the Environment, a permanent, multilateral mechanism involving government, representatives of indigenous communities, and civilian organizations in the Amazon countries, to propose joint or compatible policies for the protection of biodiversity in Indigenous Lands located in border regions;
- establish, under the auspices of the Ministry of Environment, a national monitoring programme of environmental conditions in Indigenous Lands;
- establish a joint programme of the Federal Government departments responsible for the control/elimination of illegal activities in protected areas and Indigenous Territories in Legal Amazon;
- prioritize the development of restoration programmes in environmentally degraded areas in Indigenous Territories;

- identify priority areas for biodiversity conservation which cover Indigenous Lands with the potential of providing case studies of integrated socio-environmental planning, especially where they are contiguous with, or overlap, protected areas; and
- respect the exclusive rights of use by the Indigenous communities of the genetic resources on their lands, and their associated traditional knowledge of them, in the processes which regulate access to these resources by third parties.

2.b. Management of the Public Policies for Conservation of Biodiversity

Recommendations:

- Brazilian sectoral policies should include an environmental component and the country should invest in public policy for biodiversity conservation;
- federal, state and municipal governments should create special incentive programmes specifically to promote solutions for forest fragmentation, extreme in such as the Atlantic forest, combining public and private areas in the construction of "Biodiversity Corridors";
- institutional integration of environmental institutions, with the goal of evaluating the impacts on biodiversity of planned and current development projects;
- implementation of the National System for Conservation Units– SNUC;
- implementation of the new Forest Code, based on the proposal approved by the National Environment Council (CONAMA);
- the results and review documents of the biome workshop evaluations should be adopted by the National Environment Council (CONAMA) as documents for consultation for its deliberations;
- strengthening of co-participation in the management and financing of conservation measures, between public and private sectors and communities;
- approval of legislation and the implementation of policies which minimise the environmental impacts due to production and development, with emphasis on irrigation and mining;
- the conservation of genetic, species, and ecosystem biodiversity, should be explicitly incorporated in all aspects of territorial ordination and environmental administration and management, including such concepts as "biodiversity corridors", economic-ecological zoning, master plans for territorial ordination, and the management of water resources;
- all aspects of land use planning, development projects, and socio-economic programmes should incorporate strategies that conciliate the conservation of biodiversity and water resources with their multiple uses; and
- strengthen integration between the Programme of Coastal Management and Administration and the conservation of biodiversity.

2.c. Environmental Education

Environmental education needs to become an indispensable, scientifically-based, and permanent component permeating all conservation programmes, employing participative approaches, and prioritizing medium- and long-term actions and the formation of qualified multiplier agents. The following recommendations were made (besides the specific suggestions for each of the biomes, most notable with regard to the Coastal and Marine Zones):

- Elaboration and implementation of environmental education programmes to generate a clear understanding of the importance of the forest as a source of resources and ecological services vital for the quality of life and cultural welfare of local communities;
- development of far-reaching and permanent media campaigns to increase awareness of the importance of environmental preservation and the sustainable use of natural resources;
- development of programmes which demonstrate the importance of water conservation and its sustainable use, especially in the Caatinga;
- educational programmes which focus on the connection between environmental and public health (for example, problems of predatory land use, contamination of water resources and soils);
- integration of the Ministry of the Environment with state and municipal governments, the Public Ministry and the judicial arm of the government, to hold workshops on environmental legislation, involving all government organizations which have environmental responsibilities as well as civil organizations for environmental rights;
- a joint programme of the Ministries of the Environment and Education to implement environmental education at all levels of primary and secondary education;

- integration of the Ministry of Environment with the Ministry of Health, and state and municipal governments, for the incorporation of environmental education components in the work of health and rural extension agencies;
- give greater importance to the cultures and traditional knowledge of indigenous peoples and other communities with the regard to their use of biodiversity, and its contribution to science and technology;
- development of an environmental education programme for schools and rural associations;
- reinforcement and decentralization of environmental administration and management, strengthening municipal environmental departments and their capacity to implement Agenda 21;
- support community initiatives and the creation of local environmental education centres, as local-level forums for discussions, workshops, exhibitions, and courses;
- implementation of environmental education programmes and projects, adapting them to specific local and regional realities, with emphasis on giving greater value to the cultural identity of local communities, and especially their traditional use of biodiversity and modes of interaction with their environment;
- search for alternative funding mechanisms, in the both public and private sectors, for environmental education projects and programmes;
- evaluation of the sustainability and effectiveness of current environmental education programmes;
- obligatory inclusion of environmental education components in all relevant projects with public financing;
- programmes to increase popular awareness of biodiversity and the environment, using, for example, flagship species and demonstrating the links between forests and water;
- encourage all municipalities to adopt a flagship species as a symbol for the conservation of local biodiversity and habitats;
- widespread dissemination of the environmental legislation, in language accessible to rural communities and land owners, those involved in the provision of rural credit, in agrarian reform and in policing, control, and the elimination of illegal activities, broadening as such opportunities for participation in its regulation and enforcement;
- promote measures for the transfer of relevant scientific and technological advances to professionals who work in environmental education; and
- promote the exchange of information and experiences related to the environment among staff of teaching and research institutions with other civilian sectors and government and public institutions.

2.d. Funding and Economic Incentives for Conservation

Recommendations:

- Create working groups for the establishment of programmes, compatible with federal, state and municipal planning, to secure resources from international and national funds, reinforcing as such government budgets for environmental issues;
- direct the application of financial compensatory mechanisms paid by water users and mining companies (with parity in state and municipal participation) to environmental conservation within their areas of influence, with preference given to the conservation of gallery forests and the restoration and preservation of springs;
- establish a contribution of at least 1% of the value of incentives received by companies benefiting from government financial aid for environmental preservation projects, further adding at least 3% of the total value of the government's contribution;
- encourage the implementation of the Green Tax on the Circulation of Goods and Services (*Imposto sobre Circulação de Mercadorias e Serviços - ICMS*) in all states;
- broaden the scope of the Green *Fundo Constitucional do Nordeste – FNE* [Constitutional Fund for the North-east – FNE] to include loans for RPPNs;
- provide for mechanisms to ensure that, as stipulated by the laws of cultural incentive, priority is given to projects that associate culture and archaeology, among others, to environmental conservation;
- the Government should support organizations, agencies and institutions that secure external resources for environmental conservation;
- resources from such funds as the Agricultural *Fundo Constitucional do Nordeste – FNE-Agrícola* [Constitutional Fund for the North-east – FNE], BB Organic Agriculture (*BB Agricultura Orgânica*), *Programa Nacional de Agricultura Familiar – PRONAF* [National Program of Family Agriculture – PRONAF], and others which promote sustainable agricultural practices, should be given preferentially to landowners and cooperatives on the periphery of conservation areas;
- modify the legislation licensing public works with environmental impact, so as to ensure that the resources resulting from environmental compensation are also used for the resolution of landownership in existing protected areas;

- examine the possibilities of using *Títulos da Dívida Agrária - TDA* [Agrarian Debt Titles – TDAs] for the expropriation of land in protected areas;
- parity in the partition of resources for research, dissemination and credit for the development of sustainable agriculture; and
- greater progress in the Government's discussions concerning regulation of the Clean Development Mechanism – (*Mecanismo de Desenvolvimento Limpo – MDL*), being as it is one of the most promising mechanisms currently available for unconventional financing to support economic activities in degraded areas (*Áreas Alteradas - AAs*).

2.e. Research and Training

2.e.1. Generation of sustainable technologies

Recommendations:

- Develop benchmark case studies in sustainable agricultural activities from economic, social and environmental standpoints, emphasizing small-scale, family farming, and linked to training in the relevant agencies and communities involved;
- carry out inventories and disseminate the traditional knowledge of local communities;
- develop and/or systematize dissemination methodologies;
- study the economic contributions of biodiversity and natural resources;
- create mechanisms which oblige projects involving environmental exploitation to invest in the training of human resources at all levels;
- increase support for national and international exchange programmes for professionals in teaching and research;
- improve primary, middle and high school teacher training, through collaborative agreements between local governments and universities, research institutes and the Ministry of Education (*Ministério de Educação e Cultura - MEC*);
- broaden the training of university graduate students through voluntary internships with such programmes as the *Programa Institucional de Bolsas de Iniciação Científica* – PIBIC [Institutional Start-up Grants Programme for Science- PIBIC], the *Programa de Capacitação de Recursos Humanos para Atividades Estratégicas RHAE* [Training Program for Strategic Activities – RHAE], and the *Programa Especial de Treinamento* – PET [Special Training Programme - PET;
- increase the use of short-term specialization courses for training in specific aspects of environmental conservation and management, and the sustainable use of natural resources;
- create bibliographical information systems (electronic databases and on-line journals) to support teaching and research; and
- encourage professionals in capacity-building to work in rural areas through financial incentives and supplemental salaries.

2.e.2. Financial Support for Research

Recommendations:

- Establish state foundations to support research (*Fundações Estaduais de Amparo à Pesquisa - FAPs*) in all of the nine states of Legal Amazon, with their chief emphasis being the conservation, use, and management of biodiversity;
- create an environmental compensation fund, managed by FAPs, to finance research programmes;
- oblige partnerships between consultancy firms and Amazon institutions to carry out Environmental Impact Studies/Environmental Impact Reports (*Estudos de Impacto Ambiental - EIA* and *Relatórios de Impacto Ambiental - RIMA*);
- create the requirement of regional representation when taking decisions concerning regional research projects (Higher Education Authority [*Fundação Coordenação de Aperfeicoamento de Pessoal de Nível Superior / MEC – CAPES*], National Council for Scientific and Technological Development [*Conselho Nacional de Desenvolvimento Científico e Tecnológico – CNPq*] and the Financing Agency for Research and Projects [*Financiadora de Pesquisas e Projetos* – FINEP]);
- create financing opportunities within the National Biodiversity Programme (*Programa Nacional da Diversidade Biológica – PRONABIO*) for long-term programmes, such as inventorying and monitoring biodiversity, support for biological collections, databases, and grants for higher education in biodiversity research;
- strengthen the existing financing for biodiversity research, such as: Projeto Norte for Research and Post-graduation (*Projeto Norte de Pesquisa e Pós-Graduação*), the Integrated Ecology Programme

(*Programa Integrado de Ecologia- PIE*) and the National Fund for the Environment (*Fundo Nacional do Meio Ambiente - FNMA*);

- set up partnerships between research institutes and the Brazilian Programme of Molecular Ecology for the Sustainable Use of Amazonn Biodiversity (*Programa Brasileiro de Ecologia Molecular para o Uso Sustentável da Biodiversidade da Amazônia – PROBEM*) to establish a support programme for biological collections and to qualify and secure human resources in taxonomy and systematics;

2.e.3. Strengthening infrastructure and institutional interaction

Recommendations:

- Establish systems of facilitate access to bibliographical information (electronic databases and on-line journals) in support of teaching and research;
- create a permanent forum of regional research institutions to promote thematic discussions on the classification, use, conservation and management of biodiversity;
- create a special support programme to improve the infrastructure of governmental and non-governmental scientific and cultural institutions researching biological diversity in the Amazon;
- create permanent field centres in strictly protected areas in each of the Amazon ecoregions;
- institutionalise, through on-line databases, the information existing in the biological and ethnographical collections of the region, along with efforts to repatriate information in foreign collections;
- make permanent investments to supply high speed connections for electronic exchange of information among institutions; and
- support existing, and create new, specialised laboratories for biodiversity research.

2.f Sustainable Use of Resources

2.f.1. Forest resources

Recommendations:

- Amazon - secure the only viable vocation of Amazon forest through the maintenance of the natural vegetation due to its economic value (timber and non-timber products), environmental services (prevention against fire, protection of water courses, climate regulation), biological value, social and anthropological importance, and tourism and hydroelectric potential;
- forest use - encourage activities that maintain forest cover (managed forests, planted forests, and mature fallow), agro-forestry systems, perennial cultures (for example, coffee, African palm oil, and cocoa), extractivism (for example, Brazil nuts *Bertholletia excelsa*, palm fruits [such as açaí *Euterpe edulis*, tucumá *Astrocaryum* spp., and pupunha *Guilielma gasipaes*], and rubber *Hevea brasiliensis*);
- forest management - promote sustainable forest management, with emphasis on multiple use (timber and non-timber products);
- management and protection of *várzeas* (white-water inundated forests) - study the viability of sustainable development reserves as models for forest management and sustainable fisheries in areas of *várzea*;
- forest certification - support and stimulate initiatives for the certification of sustainable exploitation of forest products;
- fire prevention - encourage productive activities which maintain forest cover in areas where there is high risk of fire;
- positive agenda - stimulate good management by reducing bureaucratic demands and the time spent in evaluating management plans, especially those drawn up by local communities, while at the same time making it more difficult in legal and bureaucratic terms to obtain authorisation for deforestation;
- foment agro-forestry activities to increase awareness of their advantages and stimulate their adoption by farmers and agricultural technicians;
- institutional financing of government departments and NGOs to solve common problems while avoiding the dispersion of efforts and resources;
- introduction of the basic concepts of agro-silviculture and conservation biology in Agrarian Science Technical Colleges;
- inclusion of courses on agro-silviculture and conservation biology in graduate courses in forestry, agronomy and animal husbandry;
- capacity-building of human resources for the development of agro-silviculture systems;
- dissemination of research findings in such a way that they can be easily assimilated and adopted by farmers
- joint participation of research, extension and agricultural agencies in setting up Demonstration Units for rural communities;

- surveys of existing technologies in the region and in other countries, which can be adopted and adapted; and
- the creation of reference databases.

2.f.2. Firewood extraction and forest restoration

Recommendations:

- Draw up recommendations to research departments and other institutions in the relevant sectors, regarding the appropriate species for reforestation by agro-ecological zone in each state;
- identify administrative or financial mechanisms for farmers and industrial consumers of firewood and charcoal to execute proposals for reforestation;
- define priority regions for reforestation, taking into consideration existing industries, deforestation rates and patterns, and areas suffering desertification;
- avoid the establishment of large landholdings by industries with high energy demands (production of lime, plaster, cement, etc.), which results in the expulsion of rural families;
- establish norms and regulations for reforestation;
- develop forestry techniques which will provide for a greater integration between farming and forestry management through agro-forest systems in areas where reforestation is obligatory;
- monitoring and technical assistance by governmental and non-governmental organizations, increasing their participation in the process through rural extension;
- support institutions involved in seed production and the distribution of seeds and seedlings of native species;
- increase the number of inspectors, and establish forest (environmental) police battalions at the state and municipal levels, for more effective control/elimination of illegal activities;
- provide incentives for campaigns to encourage rural producers to plant multiple-use forests, with policies appropriate for irrigated land and areas which do not flood in the rainy season (*sequeiros*);
- augment the economic value of forested areas by planting appropriate native species of commercial value;
- introduce practices that help reduce soil degradation, increasing timber productivity in reforested areas and reducing management needs; and
- create a database and register of producers and consumers of forest products.

2.f.3. Technological development and dissemination for sustainable use

Recommendations:

- Survey and review technologies and successful case studies of sustainable (economic and environmental) use practices by local communities, and the traditional knowledge behind them;
- divulge by all possible means, the most up-to-date technologies available in the region and in other countries, to groups working with rural extension and community development;
- create and maintain a website to provide information on available technologies for sustainable use;
- carry out meetings and workshops in order to target research on the user's needs.

2.f.4. Cultivation and use of medicinal and ornamental plants

Recommendations:

- Create a programme of incentives for pharmacological research on medicinal plants;
- create a database on the use of medicinal plants;
- create a programme of incentives for the cultivation of medicinal plants;
- assess specific botanical data for new plants with medicinal potential;
- encourage the adoption of alternative medicine;
- research the propagation and development of species with medicinal potential;
- create specific legislation for the exploitation of medicinal plants;
- implement a comprehensive programme for the rational exploitation of medicinal plants;
- institutionalise popular knowledge of the use of medicinal plants;
- research and catalogue native commercial ornamental plants; and
- research the reproductive biology of ornamental plants.

2.f.5. Minimizing the impact of agriculture on biodiversity

Recommendations:

- Measures to monitor and eliminate non-compliance by farmers of laws regarding the use of areas along rivers;

- divulge the results of research on agricultural practices and techniques in a form which can be easily assimilated by farmers;
- the use of mobile rural extension units to divulge and demonstrate sustainable practices and promote awareness and responsible action;
- integrated pest management through biological control, to reduce the use of agrotoxic chemicals;
- environmental monitoring in areas of irrigation;
- develop more efficient integrated systems to control the principal pests and diseases which affect irrigated crops, and their application in organic farming;
- development of soil and water management practices in irrigated plantations of principal fruit and vegetable crops, and the use of growth regulators, and nutritional and cultural treatments;
- development of sustainable management practices to increase productivity;
- development of rational practices for the conservation of soil, water and vegetation, and the restoration of degraded areas;
- research on the use of native species in organic agriculture (hedges, natural manure, bio-insecticides); and
- incentives for organic farming in agricultural districts.

2.f.6. Minimization of the impact of cattle ranching

Recommendations:

- Development and dissemination of technologies to increase animal productivity in areas already used for cattle ranching, avoiding its expansion to areas of native vegetation;
- development, validation and dissemination of diversified production systems (silvipastoral and agro-silvipastoral) adapted to the main agro-ecological and socioeconomic areas of the region; and
- permanent environmental monitoring in areas where cattle ranching is predominant.

2.f.7. Ecotourism

Recommendations:

- Evaluate tourism potential and create conditions necessary for ecological tourism;
- explore regional ecotourism potential, along with environmental education programmes;
- structure programmes to train and educate local labour to receive tourists;
- training and capacity-building for local communities around protected areas to make use of the opportunities provided by ecotourism in generating income;
- participatory planning and governance (through a governing council) in ecotourism projects, in order to minimize negative impacts on local populations;
- create infrastructures for tourism which are adapted to local characteristics;
- set up specific lines of credit for the sector, and support the elaboration of projects in communities which have the potential and demand for tourism; and
- support ecotourism initiatives that give value to the regional culture, and provide employment opportunities to local communities.

2.f.8. Fauna

Suggestions regarding the sustainable use of fauna were:

- Update the Official List of Brazilian Species Threatened with Extinction;
- promote basic studies for the domestication of appropriate species;
- research on techniques for the reintroduction, translocation, and stocking of species in protected areas;
- urgent measures to stop the introduction of alien invasive species;
- research on the control and elimination of alien invasive species;
- create incentives for captive breeding;
- increase capacity for the inspection and the control of illegal exploitation, capture and hunting of wildlife;
- increase the number of collaborative agreements with inspecting institutions;
- encourage environmental education;
- carry out faunal and floral surveys to provide for more informed decisions regarding authorisation of deforestation projects; and
- make better use of native species, including wild animals, with a view to regulating hunting for specific social groups.