### Article 12 Research and training

173. What is the relative priority afforded to implementation of this Article and the associated decisions by your country?									
a) High b) Medium X c) Low									
174. To what extent are the resources available adequate for meeting the obligations and recommendations made?									
a) Good b) Adequate c) Limiting X d) Severely limiting									
Further comments on relative priority and on availability of resources									

#### Question 173.

There are disparities in Brazil that inhibit the fulfilment of this article.

## Question 174.

Conselho Nacional de Desenvolvimento Científico e Tecnológico - CNPq [National Council for Scientific and Technological Development – CNPq]. The CNPq was created in 1951, and plays a significant role, with important repercussions, in the field of biological diversity. Stated goals include: (1) to promote, support and carry out scientific and technological research, and allow for the formation of human resources in all fields of knowledge; and (2) to promote, implement and maintain mechanisms of support, analysis, storage, diffusion and exchange of data and information on the development of science and technology in the country. One of the principal mechanisms by which the CNPq accomplishes these goals is scholarship quotas. These are provided for Degree programmes (Master's and Doctoral degree levels), for those beginning their scientific careers (undergraduate level), for productivity in research, technical support, visiting researchers, regional scientific development, recently graduated doctoral students and post-doctorate scholarships. The CNPq also grants scholarships overseas for senior internship/training, post-doctorates, doctoral sandwich-courses, full doctorate courses, and specialisation and advanced specialisation courses.

During 1998-1999, the number of scholarships granted by CNPq for doctoral studies related to biodiversity in Brazil increased, totaling 1783.30 in 1999 (see Table 1).

**Table 1.** Number of postgraduate scholarships granted by CNPq in areas related to biodiversity. Each scholarship corresponds to 12 (twelve) monthly payments paid in a year to one or more students.

Área	Master's	Degree	Doctoral Degree		
Area	1998	1999	1998	1999	
Chemistry	240.50	225.50	407.30	414.40	
Oceanography	37.20	33.80	15.80	18.00	
General Biology	5.40	12.20	14.90	22.60	
Genetics	74.20	59.80	81.20	74.80	
Botany	77.50	64.10	65.30	61.10	
Zoology	87.40	79.50	103.00	95.30	
Ecology	108.70	101.60	82.60	93.30	
Biochemistry	108.90	96.60	158.50	169.40	
Pharmacology	60.80	57.10	26.50	31.50	
Microbiology	38.70	38.00	50.70	55.60	
Parasitology	25.40	23.40	28.70	29.20	
Chemical Engineering	105.00	99.80	78.00	91.40	
Pharmacy	30.70	29.80	11.50	21.20	
Agronomy	425.60	409.70	344,00	377.40	
Forest Resources and Forest Engineering	54.90	46.30	26.90	23.70	
Multidisciplinary	281.10	237.20	204.40	204.40	
Total	1762.00	1614.40	1699.30	1783.30	

Fundação Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – CAPES (Higher Education Authority]. CAPES, like CNPq was created in 1951. It is a foundation of the Ministry of Education that participates in the formulation of policies regarding postgraduate education and the formation of human resources in numerous areas, including scientific and technological development. Among its programmes are: teacher and technician training; academic development, special training programmes, postgraduation sensu stricto, postgraduation overseas, visiting professor programme, support for graduation studies sensu lato, and training for elementary and high school teachers. In addition to these programmes, CAPES supports scientific events and the participation of university professors, teaching staff and researchers. It also supports the improvement of postgraduate courses and provides grants and scholarships for Master's and Doctoral degree students (see Table 2).

Table 2. Number of postgraduate scholarships granted by CAPES in areas related to biodiversity.

Área	Mast	er's Degree		Doctor's Degree		
Aica	1998	1999	2000	1998	1999	2000
Chemistry	228	334	330	208	382	270
Oceanography	48	57	58	9	36	33
General Biology	185	191	156	90	138	133
Genetics	164	151	182	69	107	142
Botany	140	118	123	69	102	99
Zoology	195	160	186	78	173	181
Ecology	135	131	138	74	136	107
Biochemistry	137	105	112	92	98	111
Pharmacology	62	41	56	42	55	60
Microbiology	110	123	98	40	53	65
Parasitology	72	53	52	45	79	81
Chemical Engineering	190	167	155	32	75	82
Pharmacy	56	87	75	7	36	33
Agronomy	124	675	608	263	423	449
Forest Resources and Forest Engineering	135	112	97	20	44	55
Multidisciplinary	306	264	218	74	94	134
Total	2287	2769	2644	1212	2031	2035

Fundação de Amparo à Pesquisa do Estado de São Paulo - FAPESP: Programa Biota/FAPESP [São Paulo State Research Support Foundation - FAPESP: Biota Programme/FAPESP]. The FAPESP Biota Programme, Instituto Virtual da Biodiversidade [Virtual Institute for Biodiversity], was begun in 1999 to provide a structure for systematic data collection, and to organize and disseminate information on the biodiversity of the state of São Paulo. The major aim of Biota/FAPESP is to inventory and characterize the biodiversity of the state, allowing for the definition of measures for its conservation, of its economic potential and for its sustainable use. The programme is supporting 37 research projects on biodiversity in the state of São Paulo. For more information see: www.biota.org.br.

The Ministry of Science and Technology maintains the following programmes:

- Programa Antártico Brasileiro PROANTAR [Brazilian Antarctic Programme]. Scientific research and associated activities of Brazil on the Antarctic continent. Research projects are related to environmental questions. They take into account the goals and directives of the Política Nacional para Assuntos Antárticos POLANTAR [National Policy for Antarctic Affairs] and the programmes and scientific initiatives proposed by the Scientific Committee for Antarctic Research SCAR, linked to the International Council of Scientific Unions ICSU. Logistic support for the PROANTAR research projects is provided by the Ministry of the Navy, and its oceanographic operations vessel "Ary Rongel". The Ministry further maintains the Antarctic Station "Comandante Ferraz", installs and maintains outposts and encampments and, in collaboration with the Força Aérea Brasileira FAB-Mmaer [Brazilian Air Force FAB/Mmaer], provides transport for the researchers and base personnel.
- Programa de Capacitação de Recursos Humanos para Atividades Estratégicas RHAE [Programme for the Capacity-building of Human Resources for Strategic Activities – RHAE]. One of the eligibility criteria RHAE projects is the development of environmental technology (utilization of Brazilian biodiversity, ecosystems management, treatment of residues, environmental administration and management, and certification norms ISO 14000).
- Programa Piloto para Proteção das Florestas Tropicais do Brasil (PPG7) / Subprograma Ciência e Tecnologia [Pilot Programme for the Protection of Brazilian Tropical Forests (PPG7) / Science and Technology Subprogramme]. The Science and Technology sub-programme is coordinated by a Technical Secretariat linked to the Secretaria de Políticas e Programas de C&T [Secretariat for Policies and Programmes in Science and Technology] of the Ministry of Science and Technology (MCT). The principal objective is to promote and disseminate scientific knowledge and technology relevant for the conservation and rational use of natural resources in the Amazon. Phase I of the Sub-programme, begun in 1995, has two components: Centros de Ciência CC [Science Centres] and Projeto de Pesquisa Dirigida PPD [Directed Research Projects PPD]. The Science Centres' component, concluded in 1999, provided institutional strengthening for two traditional research centres in Amazon: the Museu Paraense Emílio Goeldi MPEG [Emílio Goeldi Museum MPEG], Belém, and the Instituto Nacional de Pesquisas da Amazônia INPA [National Institute for Amazon Research INPA], Manaus. Twenty-three research projects were carried out within the PPD component from 1996 to 1999, and another 30 are in progress. Phase II of the Sub-programme is currently in preparation and will set up thematic research networks to provide the basis for objective and adequate responses to the major questions affecting the Amazon region today.
- Programa Ciência e Tecnologia para Gestão de Ecossistemas [Science and Technology Programme for the Administration and Management of Ecosystems]. See comments on Question 177.

n	as your country established programmes for scientific and technical education neasures for the identification, conservation and sustainable use of biological components (12a)?				
b)	early stages of development				
c)	advanced stages of development				
d)	programmes in place	X			
176. Has your country provided support to other Parties for education and training in measures for the identification, conservation and sustainable use of biological diversity and its components (12a)?					
a)	no				
b)	yes	X			
177. Does your country promote and encourage research which contributes to the conservation and sustainable use of biological diversity (12b)?					
a)	no				
b)	yes – limited extent	X			
c)	yes – significant extent				

178. Does your country promote and cooperate in the use of scientific advances in biological diversity research in developing methods for conservation and sustainable use of biological resources (12c)?				
a) no				
b) yes – limited extent	X			
c) yes – significant extent				
If a develop country Party - Does not apply				
179. Does your country's implementation of the above activities take into account the special needs of developing countries?				
a) no				
b) yes, where relevant				

## Further comments on the implementation of this Article

#### Question 175.

Projeto de Capacitação Técnica em Manejo Florestal de Impacto Reduzido - ProManejo 012 (Governo do Acre) [Project of Technical Capacity-building in Reduced Impact Forestry Management – Promanejo 012 (Government of the State of Acre)]. The goal of the Projeto Piloto de Manejo Florestal e Capacitação Técnica no Município de Sena Madureira, Acre - PROMATEC [Pilot Project of Forest Management and Technical Capacity-building in Sena Madureira, State of Acre] is to promote reduced-impact forest exploitation in the Amazon, guaranteeing specifically the development of the timber industry in the State of Acre. It is managed by the Fundação de Tecnologia do Estado do Acre- FUNTAC [Technological Foundation of the State of Acre – FUNTAC] and the Secretaria Executiva de Florestas e Extrativismo- SEFE [Executive Secretariat for Forests and Extractivism – SEFE]. Resources are provided by Promanejo (PPG-7/Ministry of Environment/ IBAMA) in the area of the A. F. G. Oliveira Company. Institution responsible: FUNTAC. Budget: Resources requested from Pro Manejo - U\$224,192.00; Total - U\$520,307.00.

Programa de Capacitação de Comunidades Extrativistas do Estado do Acre [Programme for the Capacity-building in Extractivist Communities of the State of Acre]. With access to resources provided by the Fundo de Amparo ao Trabalhador – FAT [Worker's Support Fund – FAT] in association with the Empresa de Assistência Técnica e Extensão Rural - EMATER/AC [Rural Extension and Technical Assistance Company – EMATER/AC], the aim is to benefit rural populations in the State of Acre. Extractivist workers face diverse and complex situations in their livelihood. This programme provides professional training for them, most particularly regarding the adoption of sustainable production models, often in remote areas. Institutions responsible: Secretaria de Estado da Produção – EPRO [State Secretariat for Production – EPRO]; Secretaria Executiva de Floresta e Extrativismo – SEFE [Executive Secretariat for Forests and Extractivism – SEFE]; FAT and SEFE. Budget: R\$300,000.00.

## Question 177.

Programa Ciência e Tecnologia para a Gestão de Ecossistemas [Science and Technology Programme for the Administration and Management of Ecosystems]. This programme was developed by the Ministry of Science and Technology (MCT). It includes the following activities relevant for research and training in areas related to the conservation and sustainable use of biodiversity:

- · Research and development on the composition and dynamics of Brazilian ecosystems;
- the application of science and technology within the Pilot Programme for the Protection of Brazilian Tropical forests;
- maintenance and expansion of the library of the Museu Paraense Emílio Goeldi [Emilio Goeldi Museum],
   Belém:
- preservation and expansion of the library of the Instituto Nacional de Pesquisas da Amazônia INPA
  [National Institute for Amazon Research INPA]. Coordinated by the INPA Programa de Coleções e
  Acervos Científicos [Scientific Works and Collections Programme];
- development of studies on the dynamics and composition of Amazon ecosystems;
- research and development in the Mamirauá State Sustainable Development Reserve.

Projeto de Monitoramento de Áreas Desflorestadas na Amazônia Legal—PRODES (Instituto de Pesquisas Espaciais — INPE) [Monitoring Deforestation in the Legal Amazon — PRODES (National Institute for Space Research — INPE)]. Part of the Programa Ciência e Tecnologia para Gestão de Ecossistemas [Science and Technology Programme for the Administration and Management of Ecosystems] of the Ministry of Science and Technology (MCT). The project covers an enormous area (a little more than half of the entire country) and is of enormous importance in its impact on discussions regarding social, economic and environmental aspects of the development of the region, providing the technical and scientific basis for the government to monitor and hopefully prevent the devastation of the most diverse and largest remaining tropical forest wilderness in the world. More information available at www.inpe.br.

Projeto de Conservação e Utilização Sustentável da Diversidade Biológica Brasileira - PROBIO [Project for the Conservation and Sustainable Use of Brazilian Biological Diversity – PROBIO]. The goal of PROBIO is to support the Brazilian Government in the development of the Programa Nacional da Diversidade Biológica - PRONABIO [National Biodiversity Programme – PRONABIO] by providing incentives for demonstrative subprojects, generating and disseminating information on biodiversity, and by identifying priority actions and facilitating partnerships between the public and private sectors. PROBIO is the result of the Donation Agreement TF 28309, signed 5th June, 1996, between the Brazilian Government and the Global Environmental Facility (GEF) (funds managed by The World Bank). PROBIO began in 1997 with a budget of US\$20 million. US\$10 million was provided by GEF and the World Bank, and a matching fund of US\$10 million was set aside by the Brazilian Government. The Fundo Brasileiro para a Biodiversidade - FUNBIO [Brazilian Biodiversity Fund FUNBIO], a private fund, was created at the same time. PROBIO and FUNBIO are considered to be complementary; one a State fund and the other private. PROBIO is coordinated by the Ministry of Environment (MMA) and managed by the Conselho Nacional de Desenvolvimento Científico e Tecnológico - CNPq) [National Council for Scientific and Technological Development – CNPq], which selects and finances the subprojects.

Fundação O Boticário de Proteção à Natureza [The Boticário Foundation for Nature Protection] provides financial support for conservation projects. To date, 837 projects have been approved. Of the various subprogrammes, 555 were related to "Protected Areas", "Wildlife Protection and Research" and "Green Areas", and 282 were "Other Grants". These projects, totaling US\$4,712,529.61, were distributed amongst the five regions of Brazil according to Table 3.

Table 3. Projects supported by The Boticário Foundation in different regions of Brazil.

Region*	Number	R\$	US\$
Midwest	82	364.094.703,20	524.920,03
Northeast	101	77.336.814,56	752.062,42
North	59	110.047.417,05	387.005,60
Southeast	230	617.596.286,07	1.285.046,58
South	362	1.683.288.158,88	1.763.494,98
TOTAL	834	2.852.363.379,76	4.712.529,61

<sup>\*</sup> Projects by state are listed at www.fundacaoboticario.org.br.

## Question 178.

*Projeto Genoma* [Genome Project]. Developed by the Ministry of Science and Technology (MCT), the budget is R\$355.2 million for the period of 2000-2003. Principal results include:

- Rede dos Genomas Regionais [Regional Genome Network]: Seven projects researching the structure and functioning of the genomes of organisms of interest to health and agriculture: Midwest, Minas Gerais, Northeast, *Trypanosoma cruzi*, Paraná, Rio de Janeiro, and Bahia.
- The Rede Nacional de Seqüenciamento de DNA [National Network of DNA Sequencing] involves 26 laboratories, with bioinformatics support provided by the Laboratório Nacional de Computação Científica

- LNCC [National Laboratory of Scientific Computing LNCC]. Sequencing of the bacterium Chromobacterium violaceum is almost complete.
- Support for the Laboratório Nacional de Computação Científica LNCC [National Laboratory of Scientific Computing – LNCC] and the Laboratório Nacional de Biologia Molecular Estrutural da Associação Nacional de Luz Sincroton – ABTLus [National Laboratory of Structural Molecular Biology of the National Association of Sincroton Light – ABTLus].
- Cooperação Brasil-Argentina em Biotecnologia-CBAB [Brazil-Argentina Cooperation in Biotechnology CBAB], with the implementation of 12 courses during 2001, and 13 projects approved in the last meeting of the Binational Council.
- Reports on the activities of the International Centre for Genetic Engineering and Biotechnology (ICGEB), and the selection of 15 cooperative project proposals.
- The *Projeto Genoma do Eucalipto* [*Eucalyptus* Genome Project], began in February 2002, focusing on the sequencing of transforming of *Eucalyptus* genomes.
- A meeting on technology was held in May 2002 with the Chinese delegation responsible for the Brazil-China Cooperation Programme.

*Programa Piloto para a Proteção às Florestas Tropicais do Brasil PPG7* [Pilot Program for the Protection of the Tropical Forests of Brazil PPG7]. See comments on Question 84.

Experimento de Grande Escala da Biosfera-Atmosfera na Amazônia – LBA [Large-Scale Biosphere-Atmosphere Experiment in Amazon - LBA]. An international research initiative headed by Brazil, LBA aims to increase our understanding of the functioning of the climate, ecology, biogeochemistry and hydrology in Amazon, the impact of land-use change, and the interaction between Amazon and the global biogeophysical system. LBA researches two major questions using a multidisciplinary approach, integrating studies of physical, chemical, biological and human sciences:

- How does the Amazon function, at present, as a regional entity?
- How will the changes in land use and climate affect the biological, chemical and physical functioning of the Amazon, including its sustainability and its influence on global weather?

More information available at: http://lba.cptec.inpe.br/lba/index.html.

*Projeto do Trópico Úmido – PTU* [Humid Tropics Project – PTU]. The Humid Tropics Project promotes programmes that will lead to the creation of thematic networks of research and development groups for the investigation of aspects of economic, social and strategic relevance for the Amazon region. Projects are favoured which are multidisciplinary, involving institutional partnerships and an integrated approach, to facilitate the transfer and appropriate use of the knowledge gained for the sustainable development of the Amazon. No projects were selected for the PTU in 2001, but 11 were financed at the end of 2000 and are in progress. Financing for these projects totaled R\$1,700,000.00 (Capital and Costs). Scholarships are not awarded for these projects. See: www.cnpq.br/areas/terra\_meioambiente/ptu/index.htm

Programas Básicos do CNPq [Basic Programmes of CNPq]. Basic Programmes are projects designed to advance competence and capacity in the traditional fields of knowledge. Operationally, they are different from other programmes because they respond directly to the demands of the scientific community based on the criteria of competence and merit along with assessments of priority resulting from evaluations of the status and progress in the diverse areas of scientific research. The Basic Programmes for Botany, Zoology, Ecology/Limnology and Oceanography are included in the Coordenação Geral do Programa de Pesquisas em Ciências da Terra e Meio Ambiente [General Coordination for the Research Programme in Earth Sciences and Environment].

Basic Program	Funding (R\$)
Botany	194,927.00
Zoology	184,406.00
Ecology/ Limnology	202,692.78
Oceanography, Fishing Resources and Fishing Engineering	775,089.60

#### See:

www.cnpq.br/areas/terra\_meioambiente/conhecimento/botanica/index.htm. www.cnpq.br/areas/terra\_meioambiente/conhecimento/zoologia/index.htm. www.cnpq.br/areas/terra\_meioambiente/conhecimento/ecologia\_limnologia/index.htm. www.cnpq.br/areas/terra\_meioambiente/conhecimento/oceanografia/index.htm.

*Programa WAVES* [Water Availability, Vulnerability of Ecosystems and Society in North-eastern Brazil - WAVES Programme]. This programme involves cooperation among a number of German and Brazilian institutions under the auspices of an agreement between CNPq/IBAMA/DLR. It focuses on the development of integrated mathematical models as tools in the search for strategic solutions related to global climate change. The programme is interdisciplinary, including the fields of hydrology, ecology, meteorology, climatology, pedology, agronomy and social and economic sciences. Two regions in the state of Piauí were chosen (Vale de Gurgueia/Projeto Piloto e Picos) and one in the state of Ceará (Tauá). Approximately R\$114,006.35 were spent on this programme in 2001.

*Progama MADAM* (Mangrove Dynamics and Management Programme - MADAM]. A programme conceived jointly by Brazilian and German scientists and financed by the German Government through its Ministry of Education, Science, Research and Technology (BMDF) (www.bmbf.de), and by Brazil through the *Conselho Nacional de Desenvolvimento Científico e Tecnológico – CNPq* [National Council for Scientific and Technological Development – CNPq]. MADAM is a programme of the Land-Ocean Interactions in the Coastal Zone - LOICZ, itself a sub-programme of the International Geosphere-Biosphere Program (IGBP). MADAM is also recognized by UNESCO's Man and Biosphere (MAB) programme. The study area of the MADAM project is about 150 km south of the Amazon estuary; a strip (up to 20 km wide) of 110 km² of mangroves. This area is considered especially appropriate for the interdisciplinary initiatives of MADAM. See: www.cnpq.br/areas/cooperacaointernacional/convenios/madam.htm and comments on Questions 252 and 253.

*Programa Antártico Brasileiro* – PROANTAR [Brazilian Antarctic Programme]. This programme supports substantial scientific research in the Antarctic. Besides contributing to the consolidation of Brazil's presence there, the main motivation for CNPq's support of scientific research in Antarctica is the increasing recognition that past and present natural phenomena, events and processes in the austral continent have a major influence on the environment of the entire planet. In 2001, PROANTAR granted R\$ 576,142.90 for scholarships and supports. See: www.cnpq.br/areas/terra\_meioambiente/proantar/index.htm.