



UNITED NATIONS ENVIRONMENT PROGRAMME

Programme des Nations Unies pour l'environnement Programa de las Naciones Unidas para el Medio Ambiente

Программа Организации Объединенных Наций по окружающей среде برنامج الأمم المتحدة للبيئة

联合国环境规划署



PROJECT DOCUMENT

SECTION 1: PROJECT IDENTIFICATION

1.1 Project title:	Improving Brazilian Capacity to Conserve and Use Biodiversity through Information Management and Use		
1.2 Project number:	GFL/ PMS:		
1.3 Project type:	FSP		
1.4 Trust Fund:	GEF		
1.5 Strategic objectives:			
GEF strategic long-term objective:	SO2		
Strategic programme for GEF IV:	SP4		
1.6 UNEP priority:	Environmental Governance		
1.7 Geographical scope:	National		
1.8 Mode of execution:	External		
1.9 Project executing organization:	Ministry of Science and Technology		
1.10 Duration of project:	60 months		
	Commencing:	June 2010	
	Completion:	June 2015	
1.11 Cost of project	US\$	%	
Cost to the GEF Trust Fund	8,172,728	29%	
Co-financing			
Cash			
MCT	20,000,000	71%	
<i>Sub-total</i>	20,000,000	71%	
Total	28,172,728	100%	

1.12 Project summary

Brazil is a mega-diverse country that contains an estimated 13 percent of the Earth's biodiversity. Conserving and sustainably using these biological riches requires that governments and other policy-making bodies make rational decisions about land-use and management based on the most accurate and up-to-date information. The current situation in Brazil is that much of this information is incomplete, scattered through different institutions, and not available in forms that are easily accessible or policy-relevant. To revert this situation, three groups of barriers must be addressed, namely: (i) barriers to organization, qualification and integration of information contained in Brazilian biological centers and networks; (ii) barriers to strengthening of taxonomic capacities; and (iii) barriers to effective biodiversity information management and use. If these barriers are not removed, biodiversity concerns are unlikely to be substantially mainstreamed into different productive sectors, and information generated will be insufficient or inappropriate for informing biodiversity-related policies, hence national and local government policy makers, environmental planners and key decision makers will continue to have restricted access to relevant biodiversity information and will continue making decisions in an ad hoc fashion based on the knowledge of individuals without the support of a good data infrastructure.

The GEF project's objective is *to ensure data-driven policy design and implementation by facilitating and mainstreaming biodiversity information into decision-making and policy development processes*. This will be achieved by: (i) consolidating the infrastructure, instruments, tools, and technology required to qualify, gather and make the biodiversity information contained in the resources of the country's biological collections freely available online through the Brazilian Biodiversity Information System (SIBBr); (ii) strengthening institutional and taxonomic capacities to ensure continuous uploading and updating of information into SIBBr; and (iii) development of products and services that will allow key decision-makers to establish policies that integrate biodiversity conservation and sustainable use objectives into the operations of the productive sectors. The project will build on ongoing initiatives by the Brazilian Government and will foster partnerships and collaboration among the relevant stakeholders to create an enabling framework for long-term support and achievement of project objectives. By providing authoritative, strategic and timely information to support decision-makers in the development and implementation of their policies and decisions, the project will provide the means to make better executive choices about the conservation and sustainable use of Brazil's globally significant biodiversity.

Governmental institutions, NGOs and private sector organizations involved in biodiversity research and management in Brazil will benefit from a more comprehensive, integrated and freely available system of Brazilian biodiversity information, as will the general public who has an interest in natural resources and the environment. Moreover, research and conservation organizations from around the world will benefit immensely from the SIBBr through increased access to information that can be used for research, global conservation planning and prioritization, and to contribute to the development of new economic mechanisms such as payments for ecosystem services or for avoided deforestation.

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ACRONYMS AND ABBREVIATIONS

Biota-FAPESP	<i>Programa de Pesquisas em Caracterização, Conservação e Uso Sustentável da Biodiversidade do Estado de São Paulo</i> (Research Program on Characterization, Conservation and Sustainable Use of the Biodiversity of the State of São Paulo)
CAPES	<i>Coordenação de Aperfeiçoamento de Pessoal de Nível Superior</i> (Coordination of Improvement of Higher Education Personnel)
CBD	Convention on Biological Diversity
CHM	Clearing House Mechanism (of the Convention on Biological Diversity)
CI-Brazil	Conservation International – Brazil
CAN	<i>Confederação da Agricultura e Pecuária</i> (Brazilian Confederation of Agriculture and Livestock)
CNI	<i>Confederação Nacional de Indústria</i> (National Confederation of Industry)
CNPq	<i>Conselho Nacional de Desenvolvimento Científico e Tecnológico</i> (National Scientific and Technological Research Council)
CoL	Catalogue of Life
CONABIO	<i>Comissão Nacional de Biodiversidade</i> (National Commission on Biodiversity)
CRIA	<i>Centro de Referência em Informação Ambiental</i> (Reference Centre for Environmental Information)
DNIT	<i>Departamento Nacional de Infra-Estrutura de Transportes</i> (National Department of Transport Infrastructure)
EBA	Endemic Bird Area
EMBRAPA	<i>Empresa Brasileira de Pesquisa Agropecuária</i> (Brazilian Agricultural Research Corporation)
Eol	Encyclopedia of Life
FIESP	<i>Federação das Indústrias do Estado de São Paulo</i> (São Paulo State Federation of Industries)
FIOCRUZ	<i>Fundação Oswaldo Cruz</i> (Oswaldo Cruz Foundation)
FINEP	<i>Financiadora de Estudos e Projetos</i> (Research and Project Financing Agency)
FloResCer	<i>Flora Integrada da Região Centro-Oeste</i> (Integrated Flora for the South-West Region of Brazil)
FSC	Forest Stewardship Council
GEF	Global Environment Facility
GBIF	Global Biodiversity Information Facility
GSPC	Global Strategy for Plant Conservation
GTI	Global Taxonomy Initiative
IABIN	Inter-American Biodiversity Information Network
IBAMA	<i>Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis</i> (Brazilian Institute for the Environment and Renewable Natural Resources)
IBGE	<i>Instituto Brasileiro de Geografia e Estatística</i> (Brazilian Institute for Geography and Statistics)
IBRD	International Bank for Reconstruction and Development
ICMBIO	<i>Instituto Chico Mendes de Conservação de Biodiversidade</i> (Chico Mendes Institute for Biodiversity Conservation)

INBio	<i>Instituto Nacional de Biodiversidad</i> (Costa Rican National Institute of Biodiversity)
INCRA	<i>Instituto Nacional de Colonização e Reforma Agrária</i> (National Institute of Colonization and Agricultural Reform)
INCT	<i>Instituto Nacional de Ciência e Tecnologia</i> (National Institute of Science and Technology)
IPEA	Institute of Applied Economic Research
IUCN	International Union for the Conservation of Nature
JBRJ	<i>Jardim Botânico do Rio de Janeiro</i> (Rio de Janeiro Botanical Garden)
MAPA	<i>Ministério da Agricultura, Pecuária e Abastecimento</i> (Ministry of Agriculture, Livestock and Supply)
MCT	<i>Ministério da Ciência e Tecnologia</i> (Ministry of Science and Technology)
MIN	<i>Ministério da Integração Nacional</i> (Ministry of National Integration)
MMA	<i>Ministério do Meio Ambiente</i> (Ministry of Environment)
MME	<i>Ministério de Minas e Energia</i> (Ministry of Mines and Energy)
MPEG	<i>Museu Emilio Goeldi</i> (Emilio Goeldi Museum)
MPOG	<i>Ministério do Planejamento, Orçamento e Gestão</i> (Ministry of Planning, Budget and Management)
MS	<i>Ministério da Saúde</i> (Ministry of Health)
NGO	Non-Governmental Organization
OECD	Organization for Economic Co-operation and Development
OGC	Open Geospatial Consortium
PAC	<i>Programma de Aceleração do Crecimento</i> (Program of Accelerated Growth)
PAN-Bio	<i>Diretrizes e Prioridades do Plano de Ação para Implementação da Política Nacional da Biodiversidade</i> (Guidelines and Priorities for the Action Plan for the Implementation of the National Biodiversity Policy)
PPBio	<i>Programa de Pesquisa em Biodiversidade</i> (National Programme of Biodiversity Research)
PROBEM	<i>Programa Brasileiro de Ecologia Molecular para Uso Sustentado da Biodiversidade</i> (Brazilian Molecular Ecology Program for the Sustainable Use of Amazonian Biodiversity)
PROBIO	<i>Projeto de Conservação e Utilização Sustentável da Diversidade Biológica Brasileira</i> (National Biodiversity Project)
PRONOBIO	<i>Programa Nacional de Biodiversidade</i> (National Biodiversity Program)
PROTAX	<i>Programa de Capacitação em Taxonomia</i> (Programme to Increase Taxonomic Capacity)
PSC	Project Steering Committee
RNP	<i>Rede Nacional de Ensino e Pesquisa</i> (National Teaching and Research Network)
SEMA/SP	Secretary of Environment for São Paulo
SEPED	<i>Secretaria de Políticas e Programas de Pesquisa e Desenvolvimento</i> (Secretariat of Policies and Programmes in Research and Development)
SIBBr	<i>Sistema de Informação sobre a Biodiversidade Brasileira</i> (Brazilian Biodiversity Information System)
SinBiota	<i>Sistema de Informação Ambiental do Biota</i> (Environmental Information System for Biota – Biota-FAPESP programme)
TDWG	Taxonomic Database international Working group
TNC-Brazil	The Nature Conservancy - Brazil

UNEP
WWF-Brazil

United Nations Environment Programme
World Wide Fund - Brazil

SECTION 2: BACKGROUND AND SITUATION ANALYSIS (BASELINE COURSE OF ACTION)

2.1. Background and context

1. Effective biodiversity conservation requires that governments and other policy-making bodies make rational decisions about land-use and management based on the most accurate and up-to-date information. Providing such information in a form that is accessible and policy-relevant is a major challenge. Although scientists have globally documented approximately 1.9 million species¹, many of these are very poorly known in terms of geographic distribution, ecology, conservation status and potential for sustainable exploitation². Moreover, this information is currently stored in countless different institutions, in different formats and media, and is often not available in forms that can easily be accessed and used by politicians, policy-makers and environmental managers. The practical consequences of limited access to relevant biodiversity information can be severe, potentially leading to biased or delayed progress and unwise conservation or natural resource use decisions³.

2. Many initiatives have been created with the aim of filling gaps in global knowledge about biodiversity and to facilitate access to data. The 'Catalogue of Life' (CoL) aims to become a comprehensive catalogue of all known species of organisms on Earth and it now has 1.1 million species on its annual checklist⁴. The Global Biodiversity Information Facility (GBIF⁵) provides access to 189 million species occurrence records to date. Various notable global bioinformatics projects have been developed. The 'Encyclopedia of Life'⁶ aims to "make available via the Internet virtually all information about life present on Earth"⁷ and has already created more than 150,000 vetted species pages and 1.4 million short articles. However, global initiatives such as EoL, CoL and GBIF can take at least a decade to complete⁸, and although they do provide important data, they lack specific tools and applications to assist executive decisions about the conservation, management and sustainable use of biodiversity. Meanwhile the current rate of biodiversity loss requires urgent and effective actions to be taken by policy and decision makers.

3. Brazil is a huge country with vast stores of biodiversity, a wide range of biomes, and a long history of collecting biological information. Much of this information is incomplete, scattered through different institutions, and poorly accessible. With approximately 60 percent of the world's largest continuous rainforest within its national borders - much of it unexplored - the acquisition and processing of new biodiversity information is a priority. Brazil contains around 13% percent of the world's biodiversity. The most recent edition of the Catalogue of Life (CoL) contains 1,160,711 species but it has large gaps in relation to species that occur in Brazil⁹. The online version of CoL records only 38,486 Brazilian species¹⁰. Meeting these multiple challenges and providing decision-makers with the information they need requires: (i) Strengthening of national taxonomic capacity; (ii) Concerted efforts to systematize, centralize and render accessible existing biodiversity information in a form that will facilitate policy and planning decisions, and the; (iii) Development of clear institutional arrangements to make available and share existing and future biodiversity information.

¹ Chapman, A.D. (2009) Numbers of living Species in Australia and the World 2nd edn. 80 pp. Canberra: Australian Biological Resources Study. ISBN (online): 978 0 642 56850 2.

² Whittaker, R.J., Araújo, M.B., Jepson, P. et al. (2005) Conservation biogeography: Assessment and prospect. *Diversity and Distributions*, **11**, 3–23; Lomolino, M.V., Riddle, B.R. & Brown, J.H. (2006) *Biogeography*, third edn. Sinauer, Sunderland, MA.

³ Kalliola, R., Toivonen, T., Miyakawa, V. et al. (2008) Open access to information bridges science and development in Amazonia: lessons of the SIAMAZONIA service. *Environmental Research Letters*, **3**, doi:10.1088/1748-9326/3/3/034004

⁴ <http://www.catalogueoflife.org>

⁵ <http://www.gbif.org>

⁶ <http://www.eol.org>

⁷ Wilson, E.O. (2003) The Encyclopedia of Life. *Trends in Ecology and Evolution*, **18**, 77-80.

⁸ Thomas, C. (2009) Biodiversity databases spread, prompting unification call. *Science*, **324**, 1632-1633.

⁹ MCT (2006) Diretrizes e estratégias para a modernização de coleções biológicas brasileiras e a consolidação de sistemas integrados de informação sobre biodiversidade. PPBio.

¹⁰ <http://www.catalogueoflife.org> - accessed 24/09/09

4. Brazil now has the world's eighth largest economy, and many of the activities associated with the productive sectors depend on intense natural resource use. In the last 20 years the Brazilian government has adopted an approach to sustainable development that seeks to integrate biodiversity information into governmental planning at the federal level. However, this objective has been critically weakened by the high cost-benefit ratio of access to such information. Lacking mechanisms to integrate and provide access to biodiversity and environmental information that is produced in the country, decision-makers have had to resort to meetings of specialists, turning information appropriation into a long and expensive process. Changing this situation and increasing access of decision-makers to information is therefore a priority that will be addressed by the proposed project.

2.2. Global significance

5. Brazil has an important role in efforts to conserve global biodiversity¹¹. It is the largest country in South America and one of the world's richest megadiverse countries, containing several globally important ecosystems and approximately 60 percent of the Amazon rainforest. Brazil's enormous biodiversity is partly a consequence of having several climate zones, including the humid tropics of the North, the semi-arid Northeast, and temperate areas in the South. These climatic differences have led to the formation of six distinct biomes, four of which are forests: the Amazon Forest; the Cerrado, the largest wooded-savanna area within the borders of a single country; the Caatinga, composed of semi-arid forests; and the Atlantic Forest, composed of tropical rain forest. A fifth biome, the Pantanal, while classified as an inland wetland, also includes unique forest ecosystems in the transitional zone between the Amazon and the Cerrado biomes. The final biome is the Pampa, temperate grassland in the far south of the country. Furthermore, Brazil also possesses more than 7,000 linear kilometers of coastal and marine ecosystems. Brazil's biodiversity accounts for approximately 13 percent of the world's terrestrial biota and containing between 170,000 and 210,000 described species¹². Of course, there are also many species yet to be discovered and described, especially in the vast tropical forests of the Amazon and the real figures for total species richness have been estimated to be somewhere between 1.4 to 2.4 million species¹³ (see Appendix 16 for further information on Brazil's biodiversity).

6. This biological richness however is threatened by biodiversity loss driven by habitat destruction and fragmentation, invasive species, over-exploitation and pollution. Specifically, widespread agricultural expansion (including forestry and conversion to pastures), road construction, and mining have been particularly important in driving population decline and species disappearance. Furthermore, a second set of factors such as hunting, overexploitation of timber and fuel wood, illegal trading of plants and animals, chemical pollution, oil exploration, hydroelectric projects, and unsustainable tourism are locally significant. The root causes of biodiversity loss in Brazil are related to demographic change, inequality and poverty, macroeconomic policies, social changes, and unsustainable development.

7. The above processes have led to massive changes in natural ecosystems over the last century. More than 90 percent of the Atlantic Forest biome, half of the Cerrado and Caatinga biomes, and approximately 20 percent of the Amazon Forest biome are already deforested; large numbers of biodiversity components in Brazil are in danger of becoming extinct in the near future. Currently, more than 600 animal species are officially recognized by the Brazilian government as threatened with extinction - this includes 79 threatened aquatic invertebrate species, 10 overexploited aquatic invertebrates, 130 threatened terrestrial invertebrates, 159 threatened fish, 47 overexploited fish, 20 threatened reptiles, 16 threatened amphibians, 160 threatened birds, and 69 threatened mammals.

¹¹ Mittermeier, R.A., da Fonseca, G.A.B., Rylands, A.B., Brandon, K. (2004) A Brief History of Biodiversity Conservation in Brazil. *Conservation Biology*, **19**, 601-607.

¹² Lewinsohn, T.M., Prado, P.I. (2005) How Many Species Are There in Brazil? *Conservation Biology*, **19**, 619-624.

¹³ Lewinsohn, T.M., Prado, P.I. (2002) Biodiversidade brasileira: síntese do estado atual do conhecimento. Editora Contexto, São Paulo (in Portuguese).

2.3. Threats, root causes and barrier analysis

8. For an effective national biodiversity information system to be capable to help decision making processes to counteract the afore-mentioned situation and help revert the current trends, it needs the ability to collate, compare, integrate and manage raw biodiversity data and present it in a form that genuinely informs and facilitates the decision-making process, which is currently absent. Attaining the goal of improving Brazilian capacity to conserve and use biodiversity through better information management and use will require overcoming various technical, financial, and institutional barriers that can be grouped as follows:

9. Barriers to the organization, qualification and integration of information contained in Brazilian biological centers and networks. Many of the current problems associated with creating public policy instruments based on biodiversity data are illustrated by the attempt to create maps of priority areas for conservation and sustainable use of Brazilian biodiversity – an initiative coordinated by the Brazilian Ministry of the Environment (MMA). The resulting maps were instituted by Ministerial Decree and guide important decisions on territorial zoning and land use at a national scale. The maps were created through consultations with tens of specialists between 1999 and 2000 who contributed with their individual knowledge about the geographic distribution and abundance patterns of the Brazilian flora and fauna. Due to the time and cost of identifying and gathering the specialists and recompiling the information, the first update of this document was only carried out after seven years.

10. Even with a relatively strong tradition of biodiversity monitoring and assessment, Brazil still has significant deficiencies in recording, processing and applying biodiversity information in such a way that it can be fully integrated and mainstreamed into public sectoral policies, especially with respect to environmental licensing and natural resource management. Moreover, there are also significant gaps in the biodiversity knowledge produced due to: (i) collecting being concentrated in areas of ‘easy’ access; (ii) a disparate taxonomic representation, and; (ii) irregularly spaced surveys. There has also been some duplication of collecting efforts due to an historical lack of data and information sharing. The barriers that need to be addressed to achieve adequate organization, qualification and integration of information include:

- Weak cooperation between institutions that host biodiversity data and decision-makers. There is also reluctance on the part of the scientific community to embrace a culture of free and open data sharing with non-peers; lack of partnerships between the biodiversity informatics community and the private sector;
- Lack of integration and streamlining among existing biological collections hosted in diverse and heterogeneous information systems;
- Lack of ability of existing biodiversity information systems to facilitate data sharing between diverse data providers;
- The existing communication infrastructure is not being fully taken advantage by existing data providers for sharing information. Although the current communication network is strong and covers most of the country, there are still areas uncovered by the network.
- Lack of interoperability between existing biodiversity information systems creating barriers to accessing comprehensive data even when available to end-users;
- Problems with data quality due to taxonomic issues such as synonymy, misidentification, and use of invalid or outdated names that create barriers to the integration and use of existing data-sets. Brazil lacks a single, authoritative catalogue of species names that can be used as a universal reference point for creating an interoperable biodiversity information system;
- Legacy data are not digitized, creating a barrier to the effective processing of existing information;
- Poor reliability of the infrastructure (hardware, software, local network) of some data providers;
- Lack of consensus and absence of clear guidelines on data access and sharing in the main funding agencies responsible for biodiversity-related projects. Lack of official guidelines on data-sharing

for publicly-funded research institutions and an absence of incentives (e.g. academic performance indicators) to promote sharing; and absence of 'best-practice' guidelines and indicators to assess quality and performance of biodiversity data providers.

11. Barriers to strengthening institutional and taxonomic capacities: Brazil is fortunate to have large amounts of biodiversity data held in various biological collections, government bodies, research institutions, universities and the private sector. There is also a large amount of data held in books, monographs and scientific reports. However, despite this long tradition of biological research the enormous size and mega-diverse nature of the country means that, when considered as a whole, biodiversity data are geographically and taxonomically incomplete. Knowledge gaps are particularly acute for relatively poorly studied taxa such as arthropods and for remote regions where there have been few formal surveys. The barriers to be addressed include:

- Limited funding for the maintenance and development of biological collections. There are few alternative or long-term financing mechanisms for biodiversity information initiatives, programmes and institutions;
- Many biological collections have poor infrastructure and a lack of human capacity;
- There is a general lack of human capacity in the taxonomy of many groups creating barriers to the processing of new biodiversity information;
- There is a lack of qualified curators and technicians capable of maintaining collections and developing informatics.

12. Barriers to effective information management and use: Although many institutions share responsibility for managing biodiversity in Brazil, there have so far been only limited efforts to mainstream biodiversity principles across sectors. Numerous ministries, secretariats, and government departments, along with hundreds of national and international non-governmental organizations (NGOs), foundations and research institutes are currently implementing thousands of biodiversity-related projects. Dozens of universities, consulting firms, and other private sector institutions are also involved in biodiversity conservation initiatives in Brazil. These initiatives have often met with success but most remain sporadic, uncoordinated, and isolated. Thus, despite the enormous impact other sectors have on biodiversity and the important role biodiversity can play in these sectors, conservation initiatives in Brazil are almost exclusively the domain of biodiversity and environmental stakeholders. A number of barriers need to be addressed in regard to information management and use and include:

- The current taxonomic capacity and efforts to employ analytical methods are insufficient to meet critical biodiversity knowledge requirements of decision-makers;
- The current capacity of decision-makers to access biodiversity information is critically compromised because the information is fragmented, scattered and poorly accessible;
- Existing biodiversity information is not sufficiently tailored to attend the demands of decision-makers. There is a lack of products to map and model biodiversity in ways that are accessible and useful to decision makers including interface with other key databases containing information on climate, socio-economics, land use, deforestation, demography, etc.;
- Lack of clear channels of communication between data producers and stakeholders in different sectors who require this information. More specifically, there is currently no dissemination strategy targeted at potential users in the private, non-governmental and governmental sectors at federal, state and local levels;
- Brazil lacks institutional arrangements to make available and share data and qualified information produced with stakeholders. Weak culture and no effective guidelines for assessing/monitoring financial efficiency and effectiveness within the biodiversity informatics community combined with the lack of studies on financial sustainability and effectiveness of public and private biological collections.

13. These barriers that currently restrict the public and private sector stakeholders from mainstreaming biodiversity information into decision making processes need to be overcome in order to enable authoritative, strategic and timely information to support the development and implementation of policies and decisions, thereby making better executive choices about the conservation and sustainable use of the country's biodiversity. **This is the GEF entry point to support Brazil in improving its efforts to develop effective decision-making tools to conserve global biodiversity and comply with its international commitments in this sense.**

2.4. Institutional, sectoral and policy context

Institutional and sectoral context

14. Government: Brazilian institutions and organizations involved with biodiversity conservation, natural resource management, sustainable development, and that benefit directly or indirectly from the sustainable use of biodiversity are numerous, complex and involve components that span several different sectors including agriculture, fisheries, mining, forestry, health and others. From a policy perspective the most important organizations with the most pressing needs for up-to-date, accurate and precise biodiversity information are within the Brazilian government. In 1989 various institutions with responsibility for the natural environment were restructured and regrouped within a single federal body, the Brazilian Institute for the Environment and Renewable Natural Resources (IBAMA). The governmental infrastructure for biodiversity management and use was further strengthened in 1992 with the creation of the Ministry of Environment (MMA) and in 1994 with the creation of the National Programme for Biodiversity (PRONABIO).

15. In 2003 the Environment Ministry established the National Commission on Biodiversity (CONABIO) with the purpose of strengthening the legislative and institutional framework for the management of Brazilian biodiversity. CONABIO consists of representatives from government and civil society and has a goal of assisting the government to meet its obligations under the CBD and identify priority research areas for conservation and the sustainable use of biodiversity. CONABIO has created a number of specialists' technical committees devoted to facilitating the development of different aspects of biodiversity knowledge under several different thematic heading (Collections; PAN-Bio (Guidelines and Priorities for the Action Plan for the Implementation of the National Biodiversity Policy); Biodiversity and Science.

16. Another very important government stakeholder in the use and management of biodiversity information is the Ministry of Science and Technology (MCT) and its associated funding agencies FINEP (Research and Project Financing Agency) and CNPq (National Scientific and Technological Research Council). CNPq¹⁴ finances and administrates a diverse selection of programmes in biodiversity such as PPBio and PROTAX (Programme to Increase Taxonomic Capacity). FINEP is the main Brazilian funding agency for the development of science and technology and has a mission to promote economic and social development. It provides public funding for industry, the university sector, technological institutes and other private and public institutions. MCT also administrates 16 sectoral funding agencies for science and technology. They finance a range of activities including research, technological development and innovation, with the aim of promoting synergies between universities, research centers and the productive industries. It is the responsibility of MCT to manage the data and meta-data for educational, cultural, scientific and public communication purposes. Commercial use of data is formalized by contracts between interested parties.

17. Academic and research: Brazil has a long history of biological research and a strong university system at both national and state levels. Moreover, there are many institutionalized biological collections, typically housed within universities or research institutes, with relatively comprehensive holdings of Brazilian biodiversity including some specialized collections relating to specific taxa or regions. There is a solid communication infrastructure, the National Education and Research Network (RNP) and two state networks: Rio Network (*Rede Rio*) and the Academic Network São Paulo

¹⁴ <http://www.cnpq.br/>

connecting most research institutions and universities in the state, with international links to the USA, Europe and Latin American countries.

18. Non-Governmental Organizations: One of the main stakeholders involved in strengthening the Brazilian biodiversity information base over the last decade is the Reference Center on Environmental Information¹⁵ (CRIA), a not-for-profit private organization of public interest whose main aim is to contribute towards a more sustainable use of Brazil's biodiversity through the dissemination of high quality information and education. CRIA is specifically concerned with the dissemination of electronic information as a tool for the organization of the scientific and technological communities of the country, and has been involved in a number of projects including *speciesLink* and information systems for the BIOTA-FAPESP programme to inventory and characterize the biodiversity of the State of São Paulo. CRIA has had notable success in promoting data sharing and making biodiversity resources publically available, especially for the State of São Paulo. Additionally the network has prioritized data from, and for, the scientific community with little involvement with key decision-makers within the Brazilian Government. There are also several international conservation NGOs with a presence in Brazil and an active role in funding conservation initiatives, collecting data and supporting policy decisions. Three NGOs are particularly active and have strong national organizations: Conservation International Brazil (CI-Brazil), the Nature Conservancy Brazil (TNC-Brazil), and WWF-Brazil.

19. Private Sector: Brazil now has a GDP of approximately US\$2 trillion, and the country's private sector is responsible for some outstanding milestones, including making the country the world's largest exporter of iron-ore, cane sugar, beef, chicken, orange-juice and coffee, largest producer of ethanol, as well as major producer of bauxite, aluminium, tin, nickel, cement, cellulose, automobiles, steel, and airplanes, among other important products. Two major hydroelectric dams are currently under construction by private consortia on the Madeira River and another is planned on the Xingu River. In addition to domestic investment, Brazil has attracted increased foreign investment from multi-national corporations. Both national private and public banks are financing large new projects across the country, including the necessary infrastructure to host the 2014 FIFA World Cup and 2016 Olympics. This economic growth requires intense use of Brazil's natural resources, which should be carried-out on a sustainable basis, as mandated by national laws. All large-scale projects in Brazil require Federal environmental licensing and, depending on the geographic scope of potential environmental and social impacts, smaller endeavours require state or local licensing. This makes the private sector a major stakeholder for better access to reliable information on biological diversity, in particular to aid in the environmental licensing process, to help chose among economically viable project alternatives, and to orient best business practices.

Policy and legal context

20. Brazil approved in 1981 its National Environmental Policy with the goal of preserving, improving and recovering the quality of the country's environment and harmonized with socio-economic development. The policy promotes the generation of environmental information and access to information through the SISNAMA (National Environmental System), which is comprised the environment-related institutions at federal, state and municipal levels. By ratifying the Convention on Biological Diversity (CBD) in 1994, Brazil committed itself to actions that promote the conservation, sustainable use and the equitable sharing of benefits of the country's biodiversity. In response to the CBD, MMA developed the National Biodiversity Strategy and Action Plan, which main objective is the implementation of these commitments through the definition of strategies, programs and actions. The MCT has developed guidelines for a Data Policy within its Biodiversity Research Programme (PPBio), which establishes procedures for generating and disseminating knowledge about Brazilian biodiversity for different societal sectors; it is the responsibility of MCT to manage the data and meta-data for educational, cultural, scientific and public communication purposes.

21. Brazil has a profuse legal framework at federal, state and municipal levels in regard to the environment and biodiversity in particular. Among the key laws at national level are: the Environmental Education law, the Forest Code, the Water Resources law, the Conservation Units law

¹⁵ <http://www.cria.org.br/>

and the Environmental Crimes law. Worth mention is the draft law for Registry and Dissemination of Brazilian Scientific Products (Nº1120/2007), currently being analyzed by the National Congress which objective is free Internet access to all knowledge production generated under graduate and post-graduate courses and research funded by public resources.

2.5. Stakeholder mapping and analysis

22. There are many different types of institutions and organizations that have a stake in biodiversity information management and use (see Appendix 17 for a detailed stakeholder matrix). These fall into four general groups: (i) those that generate, manage and provide biodiversity information; (ii) those that use, or could potentially use, biodiversity information to make decisions about conservation, land-use, sustainable development and natural resource management, and; (iii) those that can provide support, infrastructure and expertise; (iv) those that provide related information.

23. Information providers: Brazil has a large number of important biological collections, research programmes and projects collecting biological data and a wide range of institutions and organizations that hold relevant environmental data such as herbaria and botanic gardens, museums, government research institutes, universities and private companies.

24. The Botanical Society of Brazil maintains a directory of Brazilian herbaria¹⁶ greatly facilitating the identification of potential data-providers within this group of organisms. Brazil has over 150 herbaria, the majority of which are actively engaged in exchanging data and scientific material, the others being used for teaching¹⁷. Many of these herbaria already provide online access to specimen records or contribute to existing biodiversity information networks such as *speciesLink* and the FloResCer project¹⁸ (that makes data on the flora of the Center-West and Tocantins region publicly available). The estimated amount of specimens in Brazilian herbaria is 6 million and approximately 64 percent of this data is held in herbaria that are already engaged in making their data accessible online. Moreover, a large number of specimens collected in Brazil during the last two hundred years are deposited in collections outside the country, many of which have indicated that they would be willing to freely share their data¹⁹.

25. Brazil also has a large number of zoological specimens kept in various institutions. Vertebrates are the most comprehensively represented taxon. For example, there are 13 collections of mammals, 27 of birds, 28 of reptiles and amphibians, and 29 of fish. The holdings for each of these taxa are typically between 200,000 and 300,000 specimens. Invertebrate collections can be broadly grouped into arachnids (19 collections), insects (56 collections) and other invertebrates (54 collections). Brazil's entomology collections are particularly important and are considered the best in South America.

26. Microbial collections have distinct requirements compared to botanical and zoological collections. They work with live material important for research, quality control, biotechnology and a very large number of applications in Health, Agriculture, Industry, and Environment. Issues such as biosafety, traceability, patents, and specialized services are part of the requirements of such centers. According to WFCC-MIRCEN World Data Centre for Micro-organisms, Brazil has 53 culture collections that house nearly 38,000 strains²⁰. Brazil is also in the process of establishing four biological resource centers following the guidelines and principles on access to research data from public funding established by the Organization for Economic Co-operation and Development (OECD)²¹: the Leishmania Collection, FIOCRUZ (Oswaldo Cruz Institute), Brazilian Collection of

¹⁶ <http://www8.ufrgs.br/taxonomia/>

¹⁷ Peixoto, A.L., Barbosa, M.R.V., Canhos, D.A.L., Maia, L.C. (2009) Coleções Botânicas: Objetos e Dados Para a Ciência. In: Granato, M. & Rangel, M. (Orgs). *Cultura material e patrimônio da Ciência e Tecnologia. Museu da Astronomia e Ciências Afins*. Rio de Janeiro. ISBN 978-85-60069-22-4. (In Portuguese)

¹⁸ <http://www.florescer.unb.br/bol/home/default.aspx>

¹⁹ Canhos, D.A.L., Chapman, A., Canhos, V.P. (2004) Study on Data-sharing with Countries of Origin. Report prepared for the Global Biodiversity Information Facility (GBIF), Contract Report GBIFS/2003/04. 2004. <http://www.gbif.org/News/NEWS1082472796>

²⁰ <http://wdcm.nig.ac.jp/statistics.html>

²¹ <http://www.oecd.org/dataoecd/9/61/38500813.pdf>

Micro-organisms from the Environment and Industry (Unicamp), Rio de Janeiro Human and Animal Cell Bank, and Collection of Microbial Agents of Biological Control (Embrapa).

27. Environmental and socio-economic data are also essential for tasks such as assessing economic and social impacts in decisions that require a broader context or contain an explicit socio-economic element. Key data providers of this type of data include the Ministry of Planning, Budget and Management's (MPOG) Brazilian Institute of Geography and Statistics (IBGE)²², and the Ministry of Health (MS), Ministry of Agriculture, Livestock and Supply (MAPA). IBGE has extensive historical datasets on a wide variety of relevant areas including demography and population, agriculture, industry, urbanization, economics, and cartography.

28. End-users: The Ministry of Science and Technology's (MCT) Department of General Coordination for Biodiversity Policies and Programmes has been acting as a focal point for communication between government agencies in different sectors and has identified specific requirements of governmental decision-makers. Ministries that were identified as having a clear need for biodiversity information included the: (i) MPOG; (ii) Ministry of Mines and Energy (MME); (iii) Ministry of National Integration (MIN), and; (iv) MMA; (v) MAPA. These Ministries had specific demands. For example: MMA (including IBAMA) requires detailed biodiversity information for the effective implementation of the National Protected Areas Plan, the annual updating of the Priority Areas for the Conservation and Sustainable Use of Biodiversity Maps, the preparation of management plans for endangered species and the implementation of the Sustainable Amazon Plan. MIN, MME, and the MAPA need information that will support the implementation of National Land Use Planning and Regional Development Policies, particularly in reference to the implementation of Strategic Plans: Strategic Development Plan for the North-East Region, National Development Plan for the Semi-Arid Region, National Development Plan for the Center-West Region. Other legislative areas that will benefit from better access to biodiversity information include the control of deforestation, combating bio-piracy, and the trade in endangered plants and animals.

29. For the purpose of the proposed project, an important target group of end-users are front-line decision-makers who are involved in developing and drafting environmental legislation and policy. Such users are predominantly federal and state government officials. Furthermore, increasing the availability and usability of Brazilian biodiversity information will also benefit national and international environmental NGOs and members of the private sector who are increasingly adopting an active role in environmental governance. Another sub-set of planners and policy makers who need access to detailed and accurate biodiversity information are government departments involved in environmental licensing. IBAMA and the Secretary of State for the Natural Environment are in charge of issuing licenses for sustainable extraction of natural resources, collecting material for research or bio-prospecting, and punishing those that infringe environmental legislation. **The project will target the above end-users through specific products that have been identified during project preparation and throughout project implementation by continuous identification and update of demands.**

30. Nevertheless, given the free and open access of the proposed information system, a number of additional end-users will benefit. NGOs involved in conservation and management of natural resources by providing information that will aid their decision making processes in regard to issues such as selection of areas for restoration and establishment of biological corridors, development of management plans for threatened species, among others. Increased access to data will be useful to lecturers teaching undergraduate and postgraduate researchers in universities, as well as government research institutes. Technicians responsible for the organization, enrichment, and maintenance of biological collections will be able to improve the quality of their work through training in new techniques for the collection and preservation of specimens; networking with similar collections both within the country and worldwide, and; having access to available techniques and tools that other collections have developed. Another group of potential end-users are individuals or organizations in the private sector that make use of the products and services derived from biodiversity. This includes the extraction of natural resources such as wild grown foods, herbal medicines, cosmetics and the huge

²² <http://www.ibge.gov.br/home/>

industries dependent on timber and freshwater fisheries. Biodiversity information may also be useful to those who cultivate native plants and animals and/or use their products, such as women, and especially rural and indigenous women who are key users and managers of biodiversity. Specific examples include aquaculture projects that seek to commercially breed the world's largest freshwater fish, the pirarucu (*Arapaima gigas*), or the alligator farms that are flourishing in many areas of Brazil. Information about new technologies for more sustainable use of natural resources will also be of interest to a broader group of stakeholders who create products from biodiversity. Finally, one of the groups most interested as end-users are the private and public companies responsible for much of Brazil's leadership as an economic power. The manufacturing, civil-engineering, energy, mining, forestry, and agricultural sectors all need improved access to information on biodiversity for the environmental licensing process, improved business practices, and wise choice of viable economic alternatives that can have the most sustainable outcomes.

2.6. Baseline analysis and gaps

31. Since biodiversity is a broad and complex field, ongoing biodiversity information initiatives in Brazil tend to focus on more specific issues. At the most basic level, there are initiatives to create comprehensive and taxonomically correct species-lists or check-lists at a local, regional or national scale. Other initiatives aim to provide more detailed information on distributions, ecology, conservation status, and the presence of invasive species.

32. Brazil has developed various regional checklists of species, although these are presently incomplete, not fully collated, and have strong taxonomic and geographic biases. To date, there is no official species checklist for the whole country. The project Brazilian Flora Revisited²³ set the technical basis for the development of a collaborative online catalogue of Brazilian plants. The Botanic Garden of Rio de Janeiro acting under the guidance of MMA now has the mandate to coordinate the creation of a national list of plant species and, through a partnership with CRIA, developed a new system that imported existing lists (regional, state and taxonomic) and that is being validated by more than 300 taxonomists including many international collaborators. The first snapshot of the checklist will be made public at the beginning of 2010. The assessment of the conservation status (level of threat) of species has been formalized through the IUCN Red List system. In Brazil the list of threatened species, based on IUCN categories, has been created and managed by the Biodiversitas Foundation²⁴ under the coordination of MMA since 1992.

33. One of the main sources of primary data on the occurrence of species comes from biological collections. Globally, there are many information networks that allow access to these data. The most inclusive of these is the Global Biodiversity Information Facility (GBIF) that includes more than 180 million records from hundreds of institutions across the world. Of this total approximately 927,000 come from collections or observations in Brazil. Since 2002. The CRIA has developed the *speciesLink* system to access primary biodiversity data. The system currently integrates data from 174 collections and contains over 3 million records. Initially restricted to the State of São Paulo, *speciesLink* has gradually expanded to include collections in the States of Paraná, Espírito Santo, Rio Grande do Sul, Amazonas, the Federal District, and the Northeast of Brazil, making this information freely and openly available on the internet.

34. The Ministry of Environment (MMA) and its institutes (IBAMA and ICMBio) hold important databases and information systems such as the National Research Center for Conservation of Wild Birds (CEMAVE), Tamar Project, Meros do Brasil and Marine Mammals, among others. The observation databases OBIS BR (Ocean Biogeographic Information System) and Mamíferos Espírito Santo are linked to the *speciesLink* network.

35. Brazil has also made progress, albeit at a state level, in developing systems that integrate biodiversity data with the new generation of digital mapping tools. SinBiota²⁵, the environmental

²³ <http://flora.cria.org.br>

²⁴ <http://www.biodiversitas.org.br/home.htm>

²⁵ <http://sinbiota.cria.org.br/>

information system for the São Paulo Biota/Fapesp Program (The Research Program on Characterization, Conservation and Sustainable Use of the Biodiversity of the State of São Paulo), was developed with the aim of integrating information generated by researchers involved with the programme and relating it to a digital cartographic base. The information from these initiatives is already being used by the Secretary of Environment of São Paulo State to create maps that identify conservation units and areas for restoration. In fact the maps “Priority areas to increase connectivity” and “Priority areas for establishment of Conservation Units” produced by Biota/Fapesp have been the basis for issuance of new regulations for environmental licensing in the mining sector of the State of São Paulo²⁶. SinBiota is connected to the *speciesLink* project, but its usage as a data repository is practically restricted to researchers with direct links to Biota/Fapesp. Access to data is open and free The FloResCer project²⁷ on its part makes data on the flora of the Center-West and Tocantins region publicly available.

36. Efforts are being made to strengthen taxonomic capacity, such as those by the CNPq funded Programme to Increase Taxonomic Capacity (PROTAX), which has the aim of increasing human resources and capacity in taxonomy and the curation of biological collections. Another example is the Bionorte Network that focuses resources to improve the infrastructure of biotechnology and biodiversity in those northern States that currently lack capacity. Brazil has made strong investments in development of taxonomy (US\$45 million during the 2005/2008 period taking into account only the main collections and ongoing programmes by MCT and MMA).

37. Biological collections and associated databases constitute one of the strategic areas of MCT’s Secretariat of Policies and Programs in Research and Development (SEPED). SEPED was responsible for creating the PPBio as a means to meet some of the key demands of the CBD, the National Biodiversity Policy, and priorities arising from the National Conference on Science and Technology in 2002. PPBio was initiated in 2004 to “create an investment strategy for science, technology, and innovation, which determines priorities, integrates skills in diverse fields of knowledge, and generates, integrates, and disseminates information about biodiversity for diverse end-users”²⁸. The programme is intimately connected to other Brazilian biodiversity initiatives such as the Brazilian Molecular Ecology Program for the Sustainable Use of Amazonian Biodiversity (PROBEM) and the Project of Conservation and Sustainable Use of Brazil’s Biological Diversity (PROBIO), both coordinated by MMA. It also intersects with state level initiatives such as the Research Program in the Characterization, Conservation, and Sustainable Use of the Biodiversity of São Paulo State (BIOTA-FAPESP). The National Institute of Science and Technology’s (INCT) Virtual Herbarium of Plants and Fungi²⁹ has the mission to provide public access to plant and fungi specimens kept in Brazilian biological collections and to repatriate the numerous specimens kept in collections outside of Brazil. The Virtual Herbarium has three focal areas: research, development of human resources in taxonomy and curatorship, and the transfer of knowledge to society.

38. Despite the enormous size of the country, Brazil has a modern telecommunications infrastructure specifically developed for the academic community and public research projects. This communications infrastructure was created by the National Education and Research Network (RNP), launched in 1989 by MCT and MEC; which mission is to operate an academic communications network of national reach. Today, RNP connects 27 different States through a high performance network centered in the State capitals. RNP supports one of the most advanced high-speed optic transmission Internet infrastructures, known as *rede Ipê*, which allows connections with foreign academic networks such as Clara (Latin America), Internet2 (US) and Géant (Europe). *Rede Ipê* interconnects approximately 600 Brazilian institutions (private and public universities, research institutes, public institutions), regional and state networks. SIBBr will utilize this excellent communications infrastructure to develop its information system and associated tools and applications, allowing exchange of multi-media data. The RNP has invested in the development of the

²⁶ <http://www.agencia.fapesp.br/materia/11314/mapas-e-fundamentos-para-politicas-publicas.htm>

²⁷ <http://www.florescer.unb.br/bol/home/default.aspx>

²⁸ <http://ppbio.inpa.gov.br/Eng/sobreppbio/>

²⁹ http://www.cnpq.br/programas/inct/_apresentacao/inct_flora_fungos.html

communication system more than US\$185 million between 2005/2008 and foresees investments of US\$234 million over the next 5 years to expand and consolidate the network.

39. The country is making great efforts in advancing generation and availability of biodiversity information; however the different existing systems and networks are still geographically limited and primarily target the scientific community. As a rule, many important policy and planning decisions about the environment still rely on biodiversity information derived from small groups of experts or from a limited number of external sources. If the current scenario persists and the identified barriers are not removed, biodiversity concerns are unlikely to be substantially mainstreamed into different productive sectors, and information generated will be insufficient or inappropriate for informing biodiversity-related policies, hence national and local government policy makers, environmental planners and key decision makers will continue to have restricted access to relevant biodiversity information and will continue making decisions based on the knowledge of individuals without the support of a good data infrastructure.

2.7. Linkages with other GEF and non-GEF interventions

Links with GEF projects and activities

40. The GEF is providing financial support to a range of regional, national and state level projects, of which two are closely linked with the objective of the proposed project and coordination with them is therefore of special interest:

(i) WB/GEF Building the Inter-American Biodiversity Information Network (IABIN): This regional project (to end in 2010) involves 34 countries in the Americas; it has established several thematic networks and is developing an Internet-based platform to give access to scientifically credible biodiversity information currently scattered throughout the world in different institutions. The proposed project will take advantage of IABIN's technical expertise in the development of decision-making tools. Given the regional nature of the IABIN with the participation of all the South-American countries, an area of special interest for coordination is conservation of transboundary ecosystems since Brazil shares with these countries several globally important ecosystems. Coordination will take place through meetings between experts of the institutions participating in both projects and joint agreements. Furthermore, Brazilian institutions participating in IABIN may integrate the proposed biodiversity information system.

(ii) WB/GEF National Biodiversity Mainstreaming and Institutional Consolidation Project (PROBIO II): The objective of this MMA project is to promote mainstreaming of biodiversity principles at the national level in key public and private sector planning strategies and practices, as well as to consolidate and strengthen institutional capacity to produce and disseminate relevant biodiversity information and concepts. Component 3 of PROBIO II includes the production and exchange of biodiversity information to aid in policy-making. Both projects will be mutually complementary and will help each other in the achievement of their objectives. The biodiversity information system to be established by the proposed project will include an interface with MMA allowing for the information produced by the system to be used by the Brazilian Virtual Institute for Biodiversity and the Brazilian Center for Biodiversity Monitoring and Forecasting to be created by PROBIO II within the MMA. Coordination will take place through meetings, joint agreements, complementary workplans and collaboration between project teams. The expectation is that SIBBr will be one of MMA's major partners in the Virtual Institute, providing the baseline of quality biodiversity information, and interoperable with the Institute's complementary data-bases and supplementary systems, such as the national environmental licensing system.

Links with non-GEF projects and activities

41. The project will coordinate with national non-GEF initiatives that generate and disseminate biodiversity information in Brazil (other than the existing information systems that may actually be integrated into the information system), among them MCT's Research Program in Biodiversity

(PPBio)³⁰. The objective of PPBio is to establish a biodiversity research agenda in Brazil that promotes a favorable environment for the development of new bio-products and bio-processes focusing on conservation and the sustainable use of biodiversity, and that democratizes the knowledge generated in the process. There are many major state-level biodiversity initiatives in Brazil that will both benefit from and/or participate in the project. Examples include: Biota-Fapesp (mentioned above), a major biodiversity program of the State of São Paulo, financed by the São Paulo State Research Foundation (Fapesp) for twelve years so far and with a mandate through at least 2020; Sustainable Forestry Development of the State of Acre (Acre State); State System of Conservation Units (separate programmes in Ceará, Goiás, Minas Gerais, Mato Grosso do Sul, Pernambuco, Paraná, Rio de Janeiro, Rio Grande do Sul, Santa Catarina, Tocantins); Atlantic Forest Project and Ecological Corridors Project (Rio Grande do Sul); Pro-Atlantica Program (Paraná) and Medicinal Plants Program (Mato Grosso).

42. The project's activities will also intersect with a range of collaborative international initiatives such as: (i) the thematic programmes and cross-cutting initiatives of the CBD, including the 2010 Biodiversity Target, the Global Taxonomy Initiative (GTI), and the Global Strategy for Plant Conservation (GSPC); (ii) the development of standards and protocols by groups such as the Taxonomic Database Working Group (TDWG); (iii) international initiatives concerning the free and open access to data and information such as the Open Archives Initiative and Conservation Commons; (iv) existing information systems such as that developed by the National Institute of Biodiversity (INBio) in Costa Rica and the Virtual Herbarium hosted by the New York Botanical Garden in the USA, and; (v) the GBIF.

SECTION 3: INTERVENTION STRATEGY (ALTERNATIVE)

3.1. Project rationale, policy conformity and expected global environmental benefits

Project rationale

43. The Brazilian government has a strong commitment to the principles of sustainable development and biodiversity conservation and there is a legal mandate to integrate biodiversity information into governmental planning at the federal level. This foresighted policy has proved difficult to implement effectively due to the high cost-benefit ratio of access to biodiversity data and information caused by the lack of a mechanism to integrate and provide access to the large amounts of biodiversity data that is produced by the country. As a consequence, decision-makers frequently do not take biodiversity information into account when making executive decisions. Alternatively, they resort to meetings of specialists, an expensive ad hoc process in which results cannot be easily challenged or confirmed.

44. The proposed project will remove the identified barriers through the development of the Brazilian Biodiversity Information System – *Sistema de Informação sobre a Biodiversidade Brasileira* (SIBBr) – a fully integrated biodiversity information system with state-of-the-art visualization tools; its objective being to support more effective decision making efforts aimed at biodiversity conservation. The project will build upon the ongoing efforts and will foster partnerships and collaboration among relevant stakeholders to create an enabling framework for long-term support and achievement of the project's objectives. Project implementation will follow a two-tiered approach that comprises: (i) the integration, qualification, and organization of biodiversity data from diverse providers into the SIBBr (project outcome 1), and; (ii) the development of tools and instruments to aid in decision-making involving biodiversity issues (project outcome 3). This will be of direct benefit in fields such as natural resource and land-use planning, development of conservation project infrastructure, judicial and legislative decisions, implementation of public policies, and any other public or private sector interventions in natural areas that will benefit from access to biodiversity data. A third outcome (project outcome 2) aims at strengthening Brazilian taxonomic capacities, and will play an important supporting role to the previous outcomes by ensuring the continuous generation of new data and the improvement of data quality.

³⁰ <http://www.ppbio.inpa.gov.br/>

45. The project will not create an entirely new system. On the contrary, the SIBBr architecture will build on existing initiatives as much as possible. This approach will allow for resources to be used more efficiently, filling specific data gaps and concentrating development efforts in tools and systems that will help achieve the overall goal. This strategy not only capitalizes on existing infrastructure, experience and expertise developed by Brazilian organizations that deal with biodiversity data, but will also allow these same organizations to improve their systems and gain more visibility by becoming key players in this new initiative. The SIBBr will thus consist of a pool of independent systems, each one focused on a particular domain but also responsible for providing fundamental biodiversity data sets to the SIBBr core system, where specific applications and tools for decision-making will be available.

46. Interoperability will also be an essential aspect of the proposed architecture. Each participating organization will make its data available through a well-documented web service interface following the Brazilian interoperability standards for electronic government (e-PING³¹) and internationally accepted communication protocols. e-PING contains general interoperability guidelines for systems, including recommendations such as alignment with the Internet and preferential adoption of existing open standards. International data standards and protocols that are well known and widely adopted, such as OGC (Open Geospatial Consortium³²) standards for geospatial data and TDWG (Biodiversity Information Standards, formerly known as the Taxonomic Databases Working Group³³) standards for biodiversity data are all compatible with e-PING and will be used. By following these recommendations, integration with both government systems and other international systems will be facilitated. Additionally, each service will be publicly accessible, allowing external systems to harvest or search for specific data and will be potentially usable by any system based on a Service-Oriented Architecture³⁴.

47. To increase the robustness of each participating system, improving security and service availability, all databases will be mirrored on a server hosted and managed by the Brazilian National Education and Research Network (RNP). From this repository, data will be periodically extracted, transformed and stored into another database (the SIBBr core database) on top of which specific applications will be developed to facilitate policy and decision-making. This approach will allow data warehouse techniques and tools to be used. The project will develop and test an initial set of applications on top of the SIBBr core database to address specific demands that will be identified during the first years of the project. End-user demands will be continuously assessed and more applications can be developed in the future. With this architecture, different institutions from different sectors will be able to manage each participating system, as long as they are committed to share data according to specified requirements. The flexibility offered by this model should encourage and facilitate participation, allowing each system to evolve independently in terms of technology and functionality, as well as in terms of data quantity and quality.

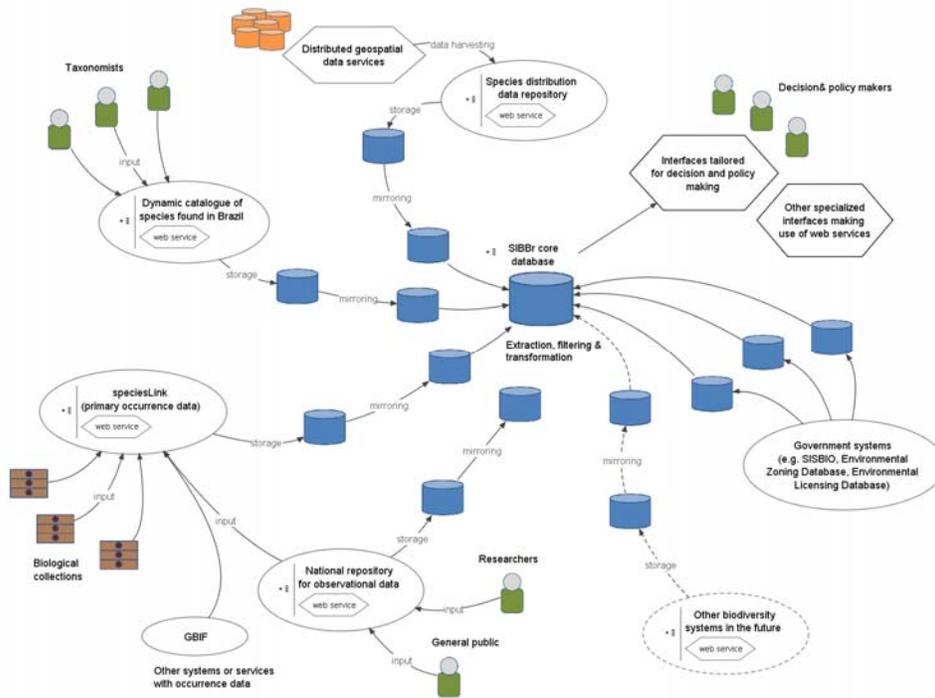
³¹ <http://www.governoeletronico.gov.br/aco-es-e-projetos/e-ping-padres-de-interoperabilidade>

³² <http://www.opengeospatial.org/>

³³ <http://www.tdwg.org/>

³⁴ Service-Oriented Architecture (SOA) is a term from computer science that refers to an architectural design where a set of independent interoperable services providing specific units of functionality can be orchestrated by other applications to produce the desired result.

Figure 1: Proposed architecture of the SIBBr



Policy conformity

48. The project is consistent with GEF’s Strategic Objective 2 (SO2) ‘Mainstreaming biodiversity in production landscapes and sectors’. The aim of mainstreaming is to integrate conservation goals and sustainable use of biodiversity into sectors that impact biodiversity outside of protected areas. Mainstreaming requires participation of both the public and private sectors in order to influence the production and extraction of natural resources (e.g. soybean, beef, biofuels, timber, charcoal, and mining). SO2 will be partly achieved through GEF’s Strategic Program 4 (SP4) ‘Strengthening the policy and regulatory framework for mainstreaming biodiversity’³⁵ which aims to support efforts to remove critical knowledge barriers, develop institutional capacities, and establish the policies, legislative, and regulatory frameworks required to integrate biodiversity conservation and sustainable use objectives into the actions of the production sectors. The SIBBr project can contribute directly to the pre-evaluation and implementation of national and regional plans of key productive sectors, internalizing issues related to biodiversity in sectoral policies by means of analyses that aid the planning decision and implementation process.

Global Environmental Benefits

49. Brazilian efforts to positively influence production, land-use and environmental management through more effective biodiversity information management and use will have a significant positive impact on the 13% of global biodiversity that is found within Brazil’s borders and will also have positive benefits for global environmental systems in which Brazilian ecosystems play a major role. For example, Amazon forests have a strong influence on regional and global climates and significant changes in ecology and ecosystem functioning would have serious consequences for the global climate system³⁶. Through promoting better management and rational decision making this initiative will help prevent the disruption of key ecosystem services such as water balance (air moisture, rainfall, river flow), heat balance (atmospheric and oceanic circulation), carbon balance (global warming), nutrient

³⁵ <http://www.gefweb.org>

³⁶ Malhi, Y. et al. (2008) Climate change, deforestation, and the fate of the Amazon. *Science* 319, 169-172.

balance (biogeochemical cycles, gases, and aerosols from forest burnings), and sediment balance (erosion and siltation downriver and in coastal zones). Similarly, strengthening and consolidating public sector institutions capable of implementing policies related to biodiversity will yield positive ramifications far beyond Brazil's borders.

50. More specifically, global benefits to be accrued include: (i) Better national decision making processes applied to biodiversity conservation and use; (ii) Enhanced exchange of information relevant to biodiversity and sustainable use of globally important biodiversity in Brazil; (iii) Greater understanding and better decision-making in the conservation and sustainable use of Brazilian biodiversity; (iv) Mainstreaming biodiversity information about globally important topics and issues associated with the natural environment (such as land-use planning and ecosystem management, sustainable use of natural resources, control of invasive pest species, the trade in endangered species, and the emergence of new epidemiologies) into global biodiversity information systems such as the GBIF and the Encyclopedia of Life (EoL). (v) A robust model for the development and implementation of a national level biodiversity information system, elements of which can be adopted by other nations (especially large biodiverse countries in the developing world) seeking to gain similar benefits.

51. The basic idea is that species and specimen level data are global public goods as public funds have been invested in their collection for nearly three centuries, and many nations continue to gather new data. The return on their investment can be multiplied by bringing these data into a network where individuals and organizations can access them to make key decisions about land-use and planning, conservation, sustainable exploitation and development, etc.

52. Global benefits will also flow from enhanced interactions of Brazil with key global conservation conventions, especially the CBD and CITES. Brazil is already a very active member of CBD and has influenced the establishment of a number of cross-cutting issues that a biodiversity information system could respond to. Brazil has also agreed, as a country member to the Convention to comply with a number of initiatives and COP recommendations. Priority areas for the CBD that could be attended by a biodiversity information system include, among others:

(i) Biodiversity Targets: the CBD is interested in assessing and monitoring the global status of biodiversity, and has established targets for reducing biodiversity loss by 2010. The SIBBr will play a major role in helping Brazil to identify whether targets have been met and helping the country to plan more effectively for any future targets;

(ii) Global Taxonomy Initiative (GTI³⁷): this CBD Programme seeks to overcome the "taxonomic impediment" to the sound management of biodiversity by improving the quality and availability of taxonomic information and infrastructure, and through developing taxonomic expertise. The GTI national focal point for Brazil is within the MCT. The Project Management Unit will closely coordinate with the focal point leader to ensure strong linkages and synergies. The creation of SIBBr will strongly support three operational objectives of the GTI: (a) Operational objective 2: Provide focus to help build and maintain the human resources, systems and infrastructure needed to obtain, collate and curate the biological specimens that are the basis for taxonomic knowledge; (b) Operational objective 3: Facilitate an improved and effective infrastructure/system for access to taxonomic information; with priority on ensuring that countries of origin gain access to information concerning elements of their biodiversity; (c) Operational objective 4: Within the major thematic work programmes of the Convention include key taxonomic objectives to generate information needed for decision-making in conservation and sustainable use of biological diversity and its components.

(iii) Global Strategy for Plant Conservation (GSPC³⁸): In 2002 the CBD adopted the GSPC with the ultimate and long-term objective to halt the current and continuing loss of plant diversity. The strategy contains 16 results-oriented targets for 2010 that the SIBBr will be able to significantly contribute towards attaining;

³⁷ <http://www.cbd.int/gti/>

³⁸ <http://www.cbd.int/gspc/>

(iv) Pollinators Initiative³⁹ (under Agricultural Biodiversity): the SIBBr will contribute to the CBD's cross-cutting initiative on the conservation and sustainable use of pollinators through enhanced monitoring of pollinator decline, improving taxonomic information on Brazilian pollinators, and through better promoting the conservation, restoration and sustainable use of pollinator diversity in agriculture and related ecosystems.

3.2. Project goal and objective

53. Brazil is requesting GEF assistance through UNEP in overcoming the constraining factors that prevent public and private sector actors from mainstreaming biodiversity information. The project's objective is *to ensure data-driven policy design and implementation by facilitating and mainstreaming biodiversity information into decision-making and policy development processes*. In this manner Brazilian decision-makers will access authoritative, strategic and timely information to support the development and implementation of policies and strategic planning decisions and to make better executive option choices about the conservation and use of globally important biodiversity in Brazil.

Hence, governmental institutions, NGOs and private sector organizations involved in biodiversity research and management in Brazil will benefit from a more comprehensive, integrated and freely available system of Brazilian biodiversity information, as will the general public who has an interest in natural resources and the environment. Moreover, research and conservation organizations from around the world will benefit immensely from the SIBBr through increased access to information that can be used for research, global conservation planning and prioritization, and to contribute to the development of new economic mechanisms such as payments for avoided deforestation or ecosystem services. With better access to quality biodiversity information, private and public sector companies and individuals that have impacts on natural resources will be able to make more efficient use of the environmental licensing process, develop better business practices, and make better choices regarding economically viable project alternatives. **Women will be key beneficiaries of these improved processes. Ultimately, better conserved and sustainably used biodiversity through improved access to information and therefore more effective decision making and implementation of sectoral policies and regulations will contribute to Brazil's efforts toward poverty alleviation.**

3.3. Project components and expected results

54. The project's intervention strategy comprises the following three outcomes and its outputs. Appendix 4 includes the project's results framework and indicators.

Outcome 1: The information contained in Brazilian biological centers and networks has been organized, qualified and integrated into the Brazilian Biodiversity Information System (SIBBr) (GEF US\$3,733,900; Co-financing US\$9,198,000)

55. The purpose of this component is to consolidate the infrastructure, instruments, tools, and technology required to qualify, gather and make the biodiversity information contained in the resources of the country's biological collections freely available online. Concerted coordination will avoid duplication of efforts and will facilitate standardization of indicators, procedures, and reporting for both the public and private sectors. This outcome will benefit all data providers (e.g. increasing institutional visibility, data cleaning, adding value to data through integration with other databases, etc.) and data users, including decision makers as more data will be made available and will become traceable through time. MCT will lead the implementation of the outputs within this outcome and has identified key potential partners, CRIA and IBICT, to assist with this process.

56. The following outputs have been planned for this component: (i) stakeholder and political articulation; (ii) communication infrastructure expanded and consolidated; (iii) increased content and usability of primary species occurrence data; (iv) biodiversity data digitized; (v) national repository for

³⁹ <http://www.cbd.int/agro/pollinator.shtml>

observational data developed; (v) dynamic catalogue for species found in Brazil developed; (vi) quality added to biodiversity data.

Output 1.1 Stakeholder and political articulation

57. MCT will work closely with all key stakeholders – data providers, users and those providing support for the infrastructure to ensure political endorsement and institutional support for the development of the SIBBr. During its first year of implementation, the project will convene meetings, workshops and individual discussions that will focus on strengthening and developing the information system and creating appropriate mechanisms of acknowledgement and compensation for active participation in the network as well as formal agreements and memoranda of understanding to establish the necessary inter-institutional partnerships envisaging the creation of the SIBBr. These actions will be closely linked to output 3.7 which will develop the governance structure and framework for long-term support to the SIBBr.

Output 1.2 Communication infrastructure expanded and consolidated

58. The SIBBr will use RNP as its basic communication network, since this system already links hundreds of institutions across Brazil. RNP, under the supervision of the MCT, will make physical improvements in the existing communication infrastructure as well as refinement and extension of the communication infrastructure in order to reach more institutions and cities at national and regional levels. The existing physical infrastructure is based on a network of optical cables (with bands of up to 10 Gbps) that connects all the Brazilian state capitals and the Federal District. However, many data providers and potential users are situated outside of the geographic bounds of the current network, therefore improvements in the RNP network will be important to promote full participation and receipt of benefits.

59. Throughout PY1-PY5 the communication system will be consolidated through: (i) improved coverage and usability of existing communication networks (for example the RNP), and; (ii) physical improvements in the communication system. Proposed improvements of the communication system include: (i) an increase of active intercommunication equipment of optical cable nodes on the RNP points; (ii) geographic expansion of *Redecomep* through the creation of regional poles (connected by optical cables) in the countryside of each state; (iii) establishment of new partnerships (with compatible and existing optical cable links) such as *Eletronorte* (Central Electricity Agency of Northern Brazil), FURNAS (Central Electricity Agency), and Petrobras, and; (iv) utilization of new technologies for the transmission of data as these become available.

Output 1.3 Increased content and usability of primary species occurrence data

60. This output will facilitate the achievement of a fully integrated and smoothly functioning information system and technical solutions/tools to facilitate the integration of data from diverse primary species occurrence data providers. Integration will be achieved through the provision of a flexible architecture, support and technical assistance such as: (i) ensuring data availability in the system; (ii) connection of databases and; (iii) ensuring compatibility of data formats through the adoption of DarwinCore (a standard designed to facilitate the exchange of primary species occurrence data) and the use of internationally accepted communication protocols.

61. The project will work closely with international partners towards the repatriation of Brazilian biodiversity data. Progress has already been made and the following biological collections are already making data available through the *speciesLink* system: New York Botanical Garden, Missouri Botanical Garden, Smithsonian Institute, University of California's Museum of Vertebrate Zoology. Furthermore MCT's funding agency, CNPq, has signed a cooperation agreement with the Natural History Museum of Paris for the creation of a virtual herbarium, and is in the process of negotiating an agreement with the Royal Botanical Gardens in the UK. These initiatives will feed directly into the project.

62. The project will procure the following inputs from CRIA, which will allow the consolidation and expansion of CRIA's *speciesLink* network by increasing the amount of online primary species occurrence data from scientific collections and improving network service quality/traceability. Expansion of data content will include the incorporation of: (i) collections in Brazil not yet online, (ii)

other collections willing to share data as well as small and specialized collections, (iii) data collected in Brazil present in international biological collections (repatriation), and; (iv) data available from the GBIF. To improve network service quality/traceability the project will develop and implement a strategy for the inclusion of global unique identifiers for each record served by *speciesLink* following TDWG's (Taxonomic Database Working Group) recommendations, and continuous development of data quality tools and applications (integrating data from new dictionaries and maps). In this way more data content and increased geographic and taxonomic coverage of primary species occurrence data will be made freely and openly available for different uses.

Output 1.4 Biodiversity data digitized

63. Digitization of data is a very important activity within the project as Brazilian collections still hold a lot of important non-digitized biodiversity data. The project will support data digitization, prioritizing holdings in biological collections and digitization of type specimen images. This support will include provision of computers, student grants, guidance on appropriate software, and basic training in the use of standards. The output will be implemented with the assistance of selected biological collections. Data digitization will be ongoing during the 5 years of the project. Expected results and products are a substantial increase in the rate of data and images being digitized and made available on the SIBBr as well as data content and quality.

Output 1.5 National repository for observational data developed

64. This project component aims to develop a new web-based system to store species observation data with priority given to data generated through MCT research programs. The system will also be open to observational data generated by NGOs, other research programs, in particular Biota-FAPESP and similar programs, and activities coordinated by MMA. A national repository for observational data will provide essential data on species occurrences that is of direct relevance to decision and policy makers.

65. The development of a national repository for observational data will incorporate the following activities: (i) definition of the functional requirements for the system, considering the possibility to store images, sounds or videos associated with each record, allow other users to help in species identification, and allow abundance data and sampling effort to be registered; (ii) definition of a data sharing policy for records stored in the system; (iii) development of a web interface with OpenID authentication for data entry and search capabilities open to the public; (iv) integration with the species catalogue developed with the SIBBr to validate names; (v) creation of a web service interface using TDWG standards that allows occurrence data to be integrated with the *speciesLink* network, and; (vi) articulation of policies to ensure that people or organizations that receive governmental funds for activities that include species inventories are obliged to store all corresponding data in the new repository.

66. The benefits of the new repository will extend beyond increasing the amount of species occurrence data available to decision makers. Data providers, including researchers, NGOs, private companies and the general public, will gain a state-of-the-art repository to store, manage and visualize their data. Data quality will also be improved and value added by using data cleaning tools available at *speciesLink*. This component will run from the second year of the project until its finalization.

Output 1.6 Dynamic catalogue for species found in Brazil implemented

67. With the participation of scientific societies, taxonomists, CRIA and other relevant organizations, the project will create a catalogue of all species that occur in Brazil and implement a system that can be used to manage and update the catalogue over time. This component is crucial to the success of the SIBBr since without an authoritative and accepted catalogue different databases cannot be effectively cross-referenced and integrated and the quality of data available to decision makers is correspondingly lowered.

68. To achieve this output the project will develop a new checklist of fauna based upon the system being used to construct the Brazilian flora checklist currently being created within the Probio project

by the Botanic Garden of Rio de Janeiro. Basic activities will include: (i) designation of one or more institutions that will be responsible for coordinating the Fauna checklist; (ii) expansion of the taxonomy system to accommodate the remaining species; (iii) a change to the existing authentication mechanisms to use OpenID; (iv) registration of all remaining collaborators; (v) identification and importation of existing checklists into the system; (vi) provision of a global unique identifier for each taxon, considering persistence and compatibility with the semantic web; (vii) specification, documentation and implementation of a web service interface allowing users to search and/or browse the catalogue (using TDWG standards if available, otherwise a new standard will be developed). The feasibility of creating a microorganisms check-list will also be investigated. These activities will be ongoing throughout PY1-PY5.

69. *Output 1.7 Quality added to biodiversity data.*

70. This output will develop and apply tools and training to improve the quality of data from biological collections. This is needed because the complexity and volume of biological data required for effective environmental decision-making must acknowledge that there are errors (e.g. in nomenclature, geo-referencing), duplications, and differences in spatial and temporal resolution among existing data. Improvement of data quality involves taxonomic studies and services to increase the number of identified species and the reliability of identifications. Data validation processes (integrity, consistency and structure), data cleaning, and geo-referencing mechanisms are essential. For example, geo-referencing can be improved through the use of applications that convert different types of representations of geographic coordinates into a standardized system. The responsibility for data cleaning will rest with the data providers. The project will facilitate this process by making applications available, advising on existing tools and protocols and, when necessary, developing new applications.

71. Data quality will be improved through the following activities: (i) evaluation of data quality requirements and issues; (ii) development of online feedback mechanisms to enable users to inform curators about errors or misidentifications; (iii) identification and incorporation of existing applications for data cleaning and increasing the precision of data; (iv) when necessary, developing new applications for the improvement of data quality.

Outcome 2: Institutional and taxonomic capacities have been strengthened to ensure continuous uploading and updating of information into the SIBBr (GEF US\$0; Co-financing US\$5,771,000)

72. The purpose of this component is to expand the national biodiversity knowledge base and data acquisition and management capacity through increased investment in the training of qualified human resources in systematics, taxonomy and curatorship, as well as through modernization and consolidation of biological collections by adding quality, adjusting the infrastructure, and organizing and managing resources. The activities should result in well-managed collections with increased expertise.

73. This outcome comprises the following four outputs: (i) the Strategic Plan to strengthen taxonomic capacity and consolidate Brazilian biological collections reviewed and updated; (ii) training on taxonomy and related fields; (iii) biological collection infrastructure and research support improved, (iv) incentives to increase taxonomic and bio-geographic knowledge.

Output 2.1 The Strategic Plan to strengthen taxonomic capacity and consolidate Brazilian biological collections reviewed and updated

74. The project will review and update the Strategic Plan based on the published guidelines originally developed by MCT in 2006⁴⁰ to reflect the most recent advances in the field of taxonomy and to fully integrate with the needs of the SIBBr for biological collections to develop the technical and human capacity to engage and contribute to the information system. The objective of the plan will be to strengthen human resources in taxonomy and correlated fields and activities. The plan will respond to

⁴⁰ MCT (2006) Diretrizes e estratégias para a modernização de coleções biológicas brasileiras e a consolidação de sistemas integrados de informação sobre biodiversidade. PPBio.

the lack of human and technical capacity in many of Brazil's biological collections and the increasing need to make the information contained in these collections available. In order to increase the biodiversity knowledge base, the plan will recognize the need to increase the number of highly qualified specialists and technicians. Specific actions recommended in the original guidelines include: (i) strengthening of graduate programmes, and a programme to improve and increase the qualification of human resources at different levels (systematists and taxonomists, specialists in biodiversity informatics, and specialized technicians in collection management and curatorial work), and; (ii) strengthening research in systematics and taxonomy.

Output 2.2 Training of staff working in taxonomy and related fields

75. Training of staffs working in taxonomy and related fields to enable their organizations to fully contribute to the project will be an important issue to be addressed in the updated Strategic Plan (Output 2.1). To achieve this output, emphasis will be given in the following activities: (i) strengthening of the government funded Taxonomy Program, PROTAX aimed at university graduate and doctoral students, post-doctoral researchers, and the curators of biological collections; (ii) targeted training courses in taxa or ecosystems that lack specialists (many invertebrate groups fall into this category); (iii) creation of new exchange programs for technical training that take maximum advantage of global taxonomic expertise at institutions such as Missouri Botanic Garden or the UK's Natural History Museum; (iv) dissemination of information about new technologies in systematics, technical training courses in collecting methodologies, and advances in the curation of collections; (v) support for technical visits to museums and institutions to acquire taxonomic knowledge in taxonomic groups that lack specialists. This action includes internships of systematists with senior specialists in national institutions or abroad, or supporting visiting specialists to national institutions, and; (vi) travel support to participate in national and international events in the field of biological systematics.

76. The responsibility for delivering these activities will rest with MCT, working closely with CNPq and CAPES to implement grants and fellowships that will directly or indirectly benefit institutional and taxonomic capacities. One example of this type of synergy is the Taxonomy Program established by CNPq/MCT in 2007. A 2009 call of CNPq (Call number 066/2009) will provide R\$13 million (approximately US\$7.5 million) to promote an increase in the number of graduates with doctorates in biodiversity and biotechnology, with a focus on the sustainable development of the Amazonia region. The project will work closely with these programmes to ensure that training and technical support is fully integrated with the goals and structure of the SIBBr.

Output 2.3 Biological collection infrastructure and research support improved

77. Several Brazilian education and research institutions have valuable holdings that are in urgent need of revitalization and modernization. In order for the SIBBr to extract the maximum value from these collections there is a critical requirement to improve the infrastructure and to modernize the collection, maintenance, and management of the specimens and associated data. Collections that will be prioritized are those considered most important in terms of geographic and/or taxonomic representation and coverage.

78. The improvement of biological collection infrastructure and research conditions will be achieved through increased investment and the closer coordination of a number of ongoing initiatives. MCT will provide funding for a new initiative that allows strategic collections to present project proposals for the improvement of their physical structure (remodeling, construction, equipment, permanent material, laboratory material, etc.) and implementation of new technologies and technical training. This initiative will link closely with the recent CAPES/MCT call for the Program of Support and Development of Botany (call number 17/2009), which has the goal of supporting research projects using human resources and infrastructure at institutions with an interdisciplinary research focus. CNPq also currently invests in the improvement of infrastructure of collections through specific calls. Other important funding agencies for maintenance and infrastructure improvements are the State Research Foundations (FAPs). There will also be targeted efforts to improve the maintenance and increased digitization of Amazonian collections (mainly those held by INPA and MPEG).

Output 2.4 Targeted incentives to increase taxonomic and bio-geographic knowledge

79. Despite the enormous amount of Brazilian biological material currently stored in national repositories and elsewhere in the world, this still reflects only a fraction of the data needed for a comprehensive biodiversity information system. The process of filling gaps in knowledge about the numbers, identities and geographic distribution of species is important for ensuring the continuing effectiveness and utility of the SIBBr. To achieve this output the project will coordinate with CNPq, CAPES and other relevant bodies to provide targeted support and identify possible funding sources and other incentives for research in less studied geographic areas and taxonomic groups. This output will be achieved through the following activities: (i) an analysis of geographic and taxonomic gaps in current knowledge about Brazilian fauna and flora in order to ascertain where incentives are most needed; (ii) developing studies and new initiatives in geographic areas that are considered priority or strategic; (iii) developing studies and new initiatives of taxonomic groups that are considered priority or which are functionally, culturally or economically important.

Outcome 3 Enabling framework to manage, distribute and use qualified information at federal, state, and local level decision making for conservation of globally significant biodiversity (GEF US\$3,606,828; Co-financing US\$3,856,286)

80. During project identification and preparation, MCT's Department of General Coordination for Ecosystem Management and Biodiversity has performed an extensive communication and data gathering exercise with other government agencies, especially the ministries of Planning, Budget and Management (MPOG), Mines and Energy (MME), National Integration (MIN), Environment (MMA), and Agriculture, Livestock and Supply (MAPA).

81. Identified needs include: (i) IBAMA and MMA require high quality biodiversity information to effectively implement the National Protected Areas Plan, the annual updating maps for the Priority Areas for the Conservation and Sustainable Use of Biodiversity initiative, the preparation of management plans for endangered species, the implementation of the Sustainable Amazon Plan, and to facilitate environmental licensing procedures; (ii) MPOG needs data to facilitate the implementation of the federal government's Growth Acceleration Plan (PAC) and to support territorial planning studies; (iii) MIN and MME need biodiversity data to support the implementation of National Land-Use Planning and Regional Development Policies, particularly in reference to the implementation of strategic plans (e.g. Strategic Development Plan for the Northeast Region; National Development Plan for the Semi-Arid Region; National Development Plan for the Centre-West Region); (iv) The private sector has also manifested its demands for biodiversity information concerning support to procedures in the area of environmental licensing to help evaluate the impact of biodiversity-related endeavours.

82. The purpose of this outcome is to manage information in order to elaborate products and services that will meet the requirements of society and allow decision-makers to effectively take into account biodiversity conservation and sustainable use issues. Knowledge production and management is sought from reconciliation/integration of the information around engaging issues (such as habitat destruction and transformation, endangered species, invasive species, protected areas, land use planning, etc.).

83. The outputs for this component are: (i) end-user demands identified and weaknesses regarding products (institutional, software, etc.) assessed; (ii) core database and framework for application development implemented; (iii) service environments and applications to map and model biodiversity developed; (iv) products and services that meet the identified requirements for decision-makers developed; (v) dissemination strategy targeted at potential users in the private, non-governmental and governmental sectors at federal, state and local levels; (vi) capacity of end-users to use the information system strengthened; (vii) a system of governance for the information system developed

Output 3.1 End-user demands identified and weaknesses regarding products (institutional, software, etc.) assessed

84. To fully assess the demands of end-users, a series of group meetings, expert meetings, and interviews will take place, and surveys of priorities and needs, will be conducted during the first three years of the project. Decision-makers responsible for conservation and sustainable use of biodiversity

will be prioritized within this process. This output will generate a list of desirable software applications to help decision-makers, from where at least 4 software applications will be selected for implementation under output 3.4. Surveys of the capacity of federal, state and municipal institutions to use the SIBBr (equipment, software, and internet connections) will also be conducted. These activities will provide information to strengthen capacities, to better manage the implementation of the project and to assess the potential use and sustainability of the system thereby increasing geographical reach under outputs 3.6 and 3.7. The project management group, under SEPED/MCT supervision, will implement this output.

Output 3.2 Core database and framework for application development implemented

85. This output will ensure that the SIBBr is an integrated information system capable of both interconnecting with, and collecting and processing raw data from all participating Brazilian biodiversity systems thereby adding value to them. In practical terms, SIBBr will ensure that a system of powerful computers, data clusters, databases, protocols, operating systems and interfaces will be interoperable and accessible. The proposed implementation plan is for the system to be operational (with a minimum of services available for users) within two years of project initiation (end of PY2). During years 3 to 5 of the project further refinements and elaborations will be made to the information system based on lessons learnt, priorities, needs and the evolution of technology as well as the integration with other relevant existing Brazilian information systems.

86. The project will create and implement an integrated information system infrastructure (the SIBBr core) that is capable of integrating existing Brazilian biodiversity information systems. The development of the SIBBr core will include refinement of system architecture, support of communication network adjustments, the integration of multi-domain databases, installation of the server, definition of protocols and other technical components. The SIBBr core will provide the basic framework for developing the software applications for decision making defined in output 3.1 and which will be developed under output 3.4.

87. Integration of biodiversity data within the SIBBr with other relevant databases relating to spatial, economics and social information (for example deforestation, cartography, fires, roads, protected areas, land zoning, etc.) is also planned. Tools like I3Geo, a web-based geographical information system developed by MMA, may be further developed and used. I3Geo is a freely accessible application that allows users to access and analyze geospatial data by providing a generic interface to geographic data held in Brazilian public institutions. By integrating biodiversity data with geospatial data from a number of different knowledge fields it will be possible to create different scenarios concerning potential changes in environmental pressures and impacts, simulate consequences of policy changes, land-use changes, climate changes, etc. All Brazilian information systems will benefit from the integration with the SIBBr and through access to the services, tools and products developed to support biodiversity conservation, sustainable use and decision making. Through this output a fully functioning nationwide data network will be achieved.

Output 3.3 Service environments and applications to map and model biodiversity developed

88. This output has three major components: (i) generation of distribution maps for species of special interest (e.g. rare, endangered or invasive species); (ii) identification of existing data providers that have information on species distributions, and; (iii) integration of data about real and potential species distributions into the SIBBr, offering advanced query and visualization tools.

89. The main objective of this component will be the development of a new system that will periodically harvest data from existing species distribution data sources to update a centralized spatial database. The new system will also allow users to upload, download, visualize and query the data. In order to achieve this objective the following activities are planned: (i) definition of the functional requirements for the system; (ii) evaluation of existing metadata standards for geospatial data; (iii) definition of a strategy to identify species distribution maps through existing protocols such as the Open Geospatial Consortium⁴¹ (OGC) catalogue service; (iv) definition of a strategy to store raster data; (v) definition of a strategy to measure and to indicate data quality for real and potential

⁴¹ <http://www.opengeospatial.org/>

distribution maps; (vi) definition of the data model and technology to be used; (vii) implementation of a data harvester, investigating existing tools such as GeoNetwork⁴²; (viii) implementation of a web interface with advanced query and visualization tools available to the public. Data entry will depend on authentication based on the OpenID standard⁴³; (ix) creation of a web service interface compatible with OGC standards on top of the database; (x) identification of existing data providers that could be integrated, such as NatureServe⁴⁴ species range maps and FishBase⁴⁵ distribution maps, and; (xi) generation of distribution maps for species of particular interest to be imported into the system.

90. MCT will be responsible for organizing and implementing these activities. There are many potential beneficiaries including all organizations and individuals with an interest in generating accurate spatial data for activities such as land use planning and the sustainable exploitation of natural resources. This group includes federal, state and municipal decision makers dealing with biodiversity issues in different sectors and any person or organization that deals with biodiversity conservation. The scientific community will also benefit from this tool, as a lot of research can be done with species distribution data.

91. Species distribution maps play a key role in strategic conservation planning activities such as defining priority areas for conservation and predicting the impact of climate changes. They may also provide valuable information in the search for rare or endangered species and in the definition of conservation threat. Other important uses of species distribution data include predicting the spread of invasive species and controlling infectious diseases that are transmitted by biological vectors.

Output 3.4 Products and services that meet the identified requirements for decision-makers developed

92. Products and tools for decision-makers will be developed to facilitate better biodiversity conservation and sustainable use activities. At least 4 products (software applications) will be discussed and defined in output 3.1. Possible products/tools include:

- Dynamic red list system: Red lists in Brazil typically take many years to be produced in an almost manual process involving experts' opinions. This process can be significantly improved by offering an online interface where experts have access to current species distribution data, number of specimens available, last observation/collecting date, results from monitoring projects, literature data, as well as specific geospatial tools. Interaction between experts could also be facilitated by the system. New assessments could be registered by experts at any time associated with different geographical levels (national or regional), potentially changing the species conservation status. Snapshots of the red list could be generated whenever necessary.
- Biodiversity inventory system: Environmental licensing and other activities that need biodiversity information about a specific area could greatly benefit from an online interface allowing users to identify species of conservation concern by biomes, geographical location, protected areas, and to generate ecological community lists for any specified region.
- Early warning system: Invasive species are one of the major threats to biodiversity, and Brazil still lacks effective mechanisms to prevent and control their spread. Existing systems providing invasive species data, such as the Instituto Hórus portal, could be integrated with SIBBr, from where specific applications could be developed making use of potential distribution maps and records from the species observational data repository. The system could be used to trigger notifications and identify areas of risk.
- Biodiversity "business intelligence" tool: SIBBr could also provide generic tools, such as Online Analytical Processing (OLAP), data mining, or relational reporting tools allowing users to answer multi-dimensional analytical queries and create customized reports on biodiversity data. These kinds of tools have been successfully used for a long time by corporations on top of data warehouses and data marts (when data is extracted from distributed operational systems to be used

⁴² <http://geonetwork-opensource.org> - GeoNetwork open-source is a standards based, Free and Open Source catalogue application to manage spatially referenced resources through the web.

⁴³ <http://openid.net/>

⁴⁴ <http://www.natureserve.org>

⁴⁵ <http://www.fishbase.org>

in centralized decision support environments). Data mining techniques can be used to discover new patterns and relationships. These tools could be especially useful within Government institutions when combined with data such as wildlife trade, deforestation, environmental violation fines, biodiversity exploitation, and wildlife incidents, among many others.

93. Products will take the form of new or improved software that provide tools to facilitate decision-making about natural resource and land-use planning, development of conservation project infrastructure, judicial and legislative decisions, implementation of public policies, and any other public or private sector interventions in natural areas that will benefit from access to biodiversity data.

94. The project management group, under SEPED/MCT supervision, will be responsible for this task. All targeted end-users will be beneficiaries, a non-comprehensive list of which includes: Chico Mendes Institute for Biodiversity Conservation (ICMbio), IBAMA, National Confederation of Industry (CNI), National Confederation of Agriculture and Livestock (CNA), State Secretariats of the Environment, Agriculture, Tourism, Science and Technology, and Development, National Institute of Colonization and Agricultural Reform (INCRA), the Ministry of Mines and Energy, the Federal Senate, municipal government and associated agencies, NGOs, institutions responsible for management of protected areas, local representatives, private organizations with a stake in the use of natural resources, and others.

Output 3.5 A dissemination strategy targeted at potential users in the private, non-governmental and governmental sectors at federal, state and local levels

95. The project dissemination strategy will develop products (digital and written media) and carry out national and state level awareness-raising events focused on the priority end-users (decision makers) with the objective of promoting a change of culture and facilitating the mainstreaming of biodiversity into diverse sectors. The products will be available for sectorial forums and relevant secretariats. The Environment and Science and Technology Secretariats will be responsible for disseminating information about the SIBBr in their respective states. Dissemination products will also be made available to organizations from other sectors such as: São Paulo State Federation of Industries (FIESP), National Confederation of Industries (CNI), Forest Stewardship Council (FSC), etc.

96. The project management group (under SEPED/MCT supervision) will be responsible for development and implementation of the dissemination strategy throughout PY2-PY5. The main beneficiaries are targeted end-users, specifically policy makers from MCT, MMA, and Environmental/Science and Technology Secretariats in each state. Other beneficiaries will include public ministries, CNI, state federations, the Federal Senate, Chamber of Deputies, and state level legislative assemblies. A larger group of targeted end-users are State Secretariats in Agriculture, Tourism, and Development, the Ministry of Mines and Energy, National Department of Transport Infrastructure (DNIT), INCRA, CAN, municipal government, NGOs, etc.

97. Expected results of implementing the dissemination strategy include an increase in the visibility, content, accessibility and use of the SIBBr thereby promoting better use of the available information for conservation of biodiversity by decision makers; and a change of culture among end-users in relation to the perception of the benefits, value and potential uses of biodiversity information.

Output 3.6 Capacities of end-users strengthened to use the information system

98. This output will seek to strengthen the capacity of end-users through the development of dedicated training courses aimed at state and federal level users of the SIBBr. The effectiveness of these training courses and materials will be assessed through dedicated surveys and specific feedback opportunities. Furthermore, training manuals for the available tools and services of the SIBBr will be prepared and state and federal level SIBBr representatives will be fully trained in use of the system. Capacity building activities will be carried out during PY3-PY5. The project will carry out the capacity building activities under the guidance of SEPED/MCT. Beneficiaries of the training courses and associated products are mainly end-users (decision-makers). Ultimately, capacity building will increase the use of the SIBBr over the time frame of the project.

Output 3.7 A system of governance for the information system developed

99. The aim of this output is to develop a structure, guidelines and protocols for governance of the SIBBr through the promotion of discussion forums such as seminars, workshops, congresses and other events that focus on the themes of structure and institutional management of the SIBBr. Part of this activity will also be to update the strategy guidelines for strengthening and modernization of biological collections and consolidation of the biodiversity information system (MCT). Mechanisms will be created that assure diverse participation in the project, and participants in the project will have different executive roles (with/without votes, observers, members, associates, donors, partners, etc) in accordance with the agreed structure. This output will be closely linked with output 1.1 (stakeholder and political articulation).

100. The expected end-products from the implementation process will include: (i) the definition of a SIBBr statute, data sharing policy and governance structure; (ii) definition of the juridical nature of the SIBBr; (iii) improved cooperation among data providers and key stakeholders; (iv) identification and elaboration of ways of representation, participation and consultation; (v) development of a sustainable financing model; (vi) updating of the MCT strategy guidelines for strengthening and modernization of biological collections and consolidation of the biodiversity information system.

3.4. Intervention logic and key assumptions

101. The proposed project follows the assumption that in order for Brazilian decision-makers to gain access to authoritative, strategic and timely information to support strategic planning decisions and to make better executive option choices about the conservation of globally important biodiversity three tightly interlinked components need to be attained. First, existing biodiversity data needs to be consolidated and integrated into a single information system that can act as the single, authoritative interface for decision makers to extract and visualize the data that is most relevant to their remit. Second, institutional and taxonomic capacities need to be strengthened to ensure an increasing supply of good quality data and to rapidly fill some of the critical gaps in taxonomic, biogeographic and conservation knowledge that are currently impeding environmental decision-making. Finally, the diverse end-users need to be made aware, and trained in the use, of the information system that will have been specifically tailored to deliver the information that they need in a form that they can use. These three components, the creation of an information system, the strengthening of taxonomic capacity, and the management of the system for optimum use by end-users will combine to provide a substantial improvement in the speed and quality of environmental decision-making in Brazil.

102. The central assumptions of the first component are that Brazil has a sufficient communications infrastructure and technical capacity to develop an appropriately sophisticated information system and that existing institutions and initiatives will subscribe to the new system. In both cases the assumptions are based on strong evidence and experience. Brazil already has a state of the art communications network (RNP) that uses an infrastructure of high-speed optic cables to link academic institutions (private and public universities, research institutes, and public institutions) and regional and state networks. SIBBr will utilize and expand this network to provide a strong platform for the development of the information system.

103. Brazil also has great experience and a high technical capacity in the development and maintenance of biodiversity information systems. Specifically, the experiences and expertise of the Reference Center on Environmental Information⁴⁶ (CRIA) may be utilized. CRIA has played a central role in a number of projects including *speciesLink* and information systems for the BIOTA-FAPESP programme to inventory and characterize the biodiversity of the State of São Paulo. Another important assumption is that a very high proportion of data providers will fully contribute to the information system and will be willing to share data and technical information. Once again, the experiences of CRIA in the State of São Paulo suggest that there is a very high probability that this assumption will be met. CRIA has had notable success in promoting data sharing among the academic and scientific community and making biodiversity resources publically available.

⁴⁶ <http://www.cria.org.br/>

104. The key assumptions underlying the strengthening taxonomic capacity in Brazil are that sufficient resources will be made available to modernize biological collections and train staff and that there are sufficient human resources available if specific regions or taxonomic domains require strengthening. In fact, important baseline and cofinancing investments are foreseen to strengthen collections. With respect to human resources, Brazil has an excellent and large university system consisting of federal and private universities that produces large numbers of technically proficient graduates and post-graduates in subjects such as ecology, zoology, botany, entomology, and environmental science.

105. The key assumptions for ensuring effective management and use of the biodiversity information made available through the SIBBr are that: (i) appropriate tools exist, or can be developed, that can deliver the biodiversity information to decision-makers and other end-users in a form that they can practically use; (ii) the SIBBr will be widely adopted throughout federal, state and local government institutions and the private sector as an essential tool for environmental decision-making. There are already many tools available for information management and use, some of which have been developed by Brazilian institutions such as CRIA. The second assumption also has a high probability of being met since the key institution with responsibility for administering and managing the SIBBr project is the Brazilian MCT which, being at the heart of government, has the capacity to ensure that the information system is fully utilized by key decision makers in the productive and conservation sectors.

3.5. Risk analysis and risk management measures

Risk	Rating	Risk mitigation measures
Weak inter-institutional coordination among key stakeholders	H/M	The Project Steering Committee will include key stakeholders. Project activities include continuous stakeholder coordination and capacity building; as well as collaboration agreements and MoUs between participating institutions.
Some data providers will not want to share their data due to the prevailing culture of data ownership.	H	The project will actively seek to achieve a consensus among data providers on a policy for data dissemination. Furthermore, data sharing will be encouraged ensuring that the origin of data is always fully acknowledged and that data-providing institutions are highly visible within the network and wider biodiversity community. Furthermore, data providers will retain full control over their data including the capacity to restrict access to sensitive data such as the geographic coordinates of rare or valuable species. Participation in networks increases visibility of data, which is in itself an important incentive to participation. Other incentives foreseen include data cleaning to increase data quality and support to digitization.
Reduced participation in SIBBr due to level/complexity of administrative and technical requirements. e.g. data format, software, hardware, etc.	M	An integral part of the project will be to link with and build upon existing biodiversity information initiatives whenever possible, and this will be achieved through close coordination with key stakeholders and by adopting a well-defined and flexible architecture. SIBBr will provide a help-desk to deal with simple problems that can be solved remotely. More generally, the information network will strive towards simplicity and inclusiveness in terms of software, hardware and the level of documentation required to join. Furthermore, common data models, applications and standard communication protocols will be chosen to ensure high levels of participation.
Poor data quality from some data providers	L	Tools and applications will be freely provided that facilitate data cleaning and standardization by allowing data providers and users to assess the quality of their data.

Risk	Rating	Risk mitigation measures
Absence of a public policy on data dissemination at national level	M/L	MCT has been holding broad-based discussions with project partners on improvement of data policy documentation to reach a consensus of various research institutions. MCT expects to produce a framework that ensures intellectual property rights and counts with the support of parties. The project will prepare and provide guidelines and manuals on data sharing and dissemination to SIBBr partners. The project's outreach programme will contribute to increase awareness on the SIBBr and availability of data.
Lack of clarity on institutional responsibilities and mandates for development and implementation of biodiversity policies	M/L	Brazil is a very large country with a complex array of ministries and institutions at both the federal and state levels, all of which can legitimately claim various degrees of responsibility for development and implementation of biodiversity policies. The project foresees articulation and coordination of key stakeholders for the development of the SIBBr. MCT has been working on the promotion of synergies, partnerships and sharing of responsibilities with the Ministry of the Environment. Specific activities to foster continuous coordination and articulation of key stakeholders are foreseen within the intervention strategy. Agreements and MoUs will be signed by the different parties to ensure issues such as political support, participation and complementarity.
Lack of sustainability	M/L	Sustainability will depend on the maintenance of the communications infrastructure; of the network's management and operation; and the ability to satisfy and deliver information needs and products according to national objectives. Maintenance of the communications infrastructure will be addressed by actions under the PluriAnnual Plan and resources from the Sectoral Funds. The RNP foresees important investments in communications infrastructure and specific contributions for effective implementation of the SIBBr are foreseen. The project will carry out specific actions to assess sustainability and develop a governance structure to ensure long-term institutional, technical and financial sustainability, including strategic partnerships among key stakeholders. Partnerships involve MCT, its institutes and financial agencies, MMA, natural history museums, botanical gardens, federal and state universities, scientific societies and key Ministries. The project will engage key stakeholders to ensure continuous identification of user demands and needs in order to develop the services and tools tailored to meet such demands as well as capacity building to make use of the SIBBr and its tools. The project's outreach and capacity-building programmes will ensure that targeted end-users are aware of the existence of the SIBBr and its use, which will increase use of the SIBBr and in turn contribute to sustainability.

H = High, M= Medium, L=Low

3.6. Consistency with national priorities or plans

Country Eligibility

106. Brazil ratified the Convention on Biological Diversity (CBD) in 1994 (Legislative Decree 2, of February 3rd, 1994; and Decree 2519, of March 16, 1998). The project has been endorsed on 28 December 2006 by the Secretariat for International Affairs of the Ministry of Planning, Budget and Management as GEF Focal Point.

Country Drivenness

107. The project is aligned with Brazil's 2007-2011 UNDAF Outcome 5 "More efficient use of available resources is ensured to promote an equitable and environmentally sustainable economic development" and its respective Country Programme Outcomes 5.2 "Public policies with increased mainstreaming and crosscutting of the environmental dimension in their design, implementation, management, monitoring and evaluation" and 5.3 "Public policies with increased mainstreaming and crosscutting of the environmental dimension in their design, implementation, management, monitoring and evaluation".

108. The project is consistent with the National Biodiversity Strategy and Action plan, initiated by MMA in 1998 as a substantive response to the obligations demanded by ratification of the CBD and the Revised National Biodiversity Action Plan (CONABIO Decision 40, March 2006). One of the main objectives of the Strategy is the 'creation and implementation of the Biodiversity Information Network'⁴⁷, a goal that will be largely facilitated through the current project. Another key objective is the 'strengthening of regional cooperation concerning biodiversity issues', which will also be facilitated through the creation of a more comprehensive and integrated biodiversity information system.

109. The project is also consistent with the National Biodiversity Policy (Federal Decree 4339, 2002) and will contribute to the achievement of several targets established in the National Protected Areas Plan (Federal Decree 5758, 2006), the Priority Areas for Conservation, Sustainable Use and Benefit Sharing of Biodiversity in Brazil (Federal Decree 5092, 2004). The objectives of this project are also in line with the recommendations made at the Second National Conference on Science and Technology (September 2001) and at the Third National Conference on Science, Technology and Innovation (November 2005).

110. The project is aligned with the MCT's mandate to manage and disseminate scientific and technical data and information, and with its Strategic Plan which identifies as priority areas: (i) support for inventory networks; (ii) dissemination of scientific knowledge, and; (iii) implementation of an integrated system for the monitoring of biodiversity information for international cooperation. Additionally, the MCT is committed to improving gender equality in science and adheres to the "Recommendations for Integrating a Gender Perspective in Science and Technology Policies and Programs in the Americas" (OAS, 2004), which guidelines will be taken into account throughout project implementation.

111. The project, by providing information to decision-making processes will also support a more effective implementation of the new economic and social development model adopted by the federal government, the Programme of Accelerated Growth (PAC), that includes large federal investment in infrastructure of key sectors such as transport, energy, production, exploration and transport of oil, gas and renewable fuels, sanitation, housing and water resources.

112. In regard to Brazil's international commitments under the CBD, the project will strongly assist Brazil in fulfilling several specific commitments to the CBD, particularly those set for the identification and monitoring of biodiversity, exchange of information, and technical and scientific cooperation with the policies and guidelines of the Clearing House Mechanism (CHM). Specifically, SIBBr will help Brazil to meet CBD article 17 concerning the exchange of information and making such information available to the public.

⁴⁷ <https://www.cbd.int/countries/profile.shtml?country=br#nbsap>

113. The SIBBr will also strongly support the Brazilian government's efforts to comply with decision IX/30⁴⁸ on Scientific and Technical Cooperation and the Clearing House Mechanism taken by the Conference of Parties (COP) at the ninth meeting of the CBD in May 2008. This decision encourages parties to take some of the following steps of direct relevance to the current project: (2d) "...develop information exchange mechanisms with relevant national databases, making use, whenever applicable and appropriate, of well-established open standards"; (2f) "Mobilize and allocate resources for strengthening the institutional capacity to implement the national clearing-house mechanism and for sustaining its operations"; (2g) "Define roles and responsibilities for collecting, reviewing and disseminating information, managing website content, and for outreach activities". The decision also encourages partners holding biodiversity-related information to "Contribute to the establishment of regional, subregional or thematic clearing-house mechanisms, with a view to provide support to national clearing-house mechanisms, to share knowledge and to facilitate scientific and technical cooperation, including cooperation on science and innovation as well as the transfer of technology" (3c).

114. The project will support progress toward Brazil's CBD targets for 2010 (and any future targets) by promoting appropriate policies and practices and the dissemination of biodiversity information relevant to policymaking. The component will also monitor the progress made on key biodiversity indicators, including those linked to the CBD targets for 2010. These two goals are linked; the generation of relevant information requires stronger, better-coordinated institutions, and the information produced will further strengthen the capacity of the biodiversity sector, especially as it relates to public policy development. The National Biodiversity Committee (CONABIO) adopted a set of 51 National Biodiversity Targets for 2010 (Resolution 3/2006), of which several are related to biodiversity information: (i) Target 1.1. An expanded and accessible list of formally described species of Brazilian plants and vertebrates, and of invertebrates and micro-organisms, these possibly selectively developed, in the form of permanent databases, (ii) Target 1.2. National Taxonomy Programme established, aiming at a 50% increase in scientific records with an emphasis on new species descriptions; (iii) Target 1.3. Virtual Brazilian Biodiversity Institute created and the expansion of the Biodiversity Research Programme (PPBio) from Amazonia and the Caatinga to the remaining biomes in order to increase availability of information on biodiversity.

3.7. Incremental cost reasoning

115. Brazil has taken several initiatives to conserve its biodiversity, but these are isolated efforts by a number of institutions and, as such, need to be streamlined and coordinated. Technical and scientific cooperation and information exchange are increasingly perceived as necessary and are currently the most important paradigm on conservation and sustainable use of biodiversity. Without a major investment, little will change in the context of mainstreaming biodiversity information. As in many other countries the rapidly growing quantity of raw data is a positive development, but for policy-making processes these data and information have limited use because of difficulties associated with access and format. The baseline entails an array of organizations that continue to generate information that is hardly used by policy makers.

116. Under the 'business as usual' scenario Brazilian institutions will continue to generate large amounts of information on biodiversity, some of which will be made available through institutional websites or links to regional, national, or global biodiversity information networks. Some of the existing biodiversity information that is not yet available online will be digitized but the rate of conversion and taxonomic coverage will continue to be largely dependent upon institutional funding and prioritization. Biodiversity information will continue to be produced in a wide variety of formats, many of which are not interoperable. New initiatives will be unlikely to benefit from knowledge generated from past activities, and synergies between projects will continue to be missed. The RNP network will continue to provide excellent infrastructure support for academic and public institutions but will not be fully utilized to improve access and use of Brazilian biodiversity information.

⁴⁸ <http://www.cbd.int/doc/decisions/cop-09/cop-09-dec-30-en.doc>

117. The Ministry of Education's body for the Coordination of Improvement of Higher Education Personnel (CAPES) and the MCT-coordinated National Scientific and Technological Research Council (CNPq) and the Research and Project Financing Agency (FINEP), will continue to invest in the National Academic Cooperation Program by supporting network projects and capacity building actions. These actions are not enough to create a coordinated capacity at the national level to attend the demands for information from stakeholders. The use of biodiversity information by stakeholders will thus be modest. Under this scenario, PPBio will continue to support about 10 networks located in Amazonia and the Semi-Arid regions, but the programme will not have the capacity to expand activities into other biomes and will not be able to support the increase in the number of institutions entering the networks within those regions.

118. National and local government policy makers, environmental planners, private companies, and key decision makers will continue to have restricted access to relevant biodiversity information and will continue making decisions based on the knowledge of individuals without the support of a good data infrastructure. When biodiversity data are available, they are normally incomplete and often not in an adequate format. This means that primary data will continue to be unavailable or ineffectively used to inform important decisions about conservation, land use and natural resource management. Moreover, the continued lack of a coordinated, effective system of biodiversity information management will continue to impede the mainstreaming of biodiversity into other productive sectors. Decision makers will lack both awareness of the importance and value of biodiversity for their sector, and the effective tools that would facilitate the integration of biodiversity data into the wider context of environmental decision-making.

119. In summary, the baseline scenario would generate benefits, especially in the realm of biodiversity information, and would likely have local benefits in terms of limited biodiversity conservation in specific geographic areas. However, due to the fragmented nature of mainstreaming initiatives, the lack of coordination and synergies among different activities and between the public and private sectors, the weaknesses of certain institutions, and the incomplete nature of information generated and shared, global conservation benefits would be limited. Under the baseline scenario, biodiversity concerns are unlikely to be substantially mainstreamed into different productive sectors, and information generated will be insufficient or inappropriate for informing biodiversity-related policies.

120. Under the GEF Alternative Brazilian decision-makers will access authoritative, strategic and timely information to support the development and implementation of policies and strategic planning decisions and to make better executive option choices about the conservation of globally important biodiversity in Brazil. The project will make it possible to: (i) Expand the activities of PPBio into the Atlantic Forest and Cerrado biomes with an emphasis on conserving globally significant biodiversity; (ii) Support the increase in the number of institutions contributing to the networks currently working within the Amazonian and Semi-Arid regions; (iii) Create networks that will integrate and be interoperable with existing national and international initiatives; (iv) Enlarge, consolidate and improve the biodiversity information base; (v) Improve access to the scientific knowledge on biodiversity generated within the country; (vi) Create an environment that is conducive to knowledge management; (vii) Apply and disseminate high quality scientific information in government sectors, in particular to decision-makers and managers. GEF funds will be used to enhance and expand the global significance of existing activities. This will allow for improvements in existing actions, making critical adjustments, and creating opportunities for new globally significant biological data activities. GEF funds under the project coordination component will be used to monitor project progress and impact, and to encourage participation of all stakeholders (international, national and local) throughout all stages of the project.

121. Within this context, the Baseline Scenario identifies ongoing and planned initiatives that are relevant to the project's outcomes over the proposed 5-year life of the project (project boundary). The GEF Alternative consists of the Baseline in addition to the costs associated with the necessary incremental activities to achieve the project objective. The Incremental Cost is the difference between the costs of the GEF Alternative and the Baseline Scenario. The total cost of the project, including GEF funds and co-funding, amounts to US\$28,172,728. GEF financing comprises 29% of the total, or

US\$8,172,728. Co-financing constitutes 71% or US\$20,000,000. The incremental cost matrix in Appendix 6 provides a summary breakdown of baseline costs and co-funded and GEF-funded alternative costs.

3.8. Sustainability

122. The project's sustainability will be based upon: (i) institutional and sectoral sustainability; in other words, the continuing ability of stakeholders and project participants to fulfill their role in the project and support the long-term development of the SIBBr; (ii) the strong existing legal and regulatory framework regarding biodiversity information to support future initiatives and ensure the continuing involvement and support of public institutes and organizations; (iii) the maintenance and development of a strong technical infrastructure, and; (iv) a robust and diversified portfolio of potential funding sources.

123. The continuing and productive involvement of key stakeholders will be partly ensured by capacity building and consolidation of those stakeholders dealing with biodiversity information issues in Brazil. By investing in training, modernization and improving infrastructure, the project will create a strong platform for future initiatives and create a data-rich environment for environmental decision-making. The increased availability and accessibility of biodiversity data will help to engage a wide variety of new stakeholders from different sectors and provide them with the tools to develop long-term cross-cutting biodiversity approaches. The project will thus create an enabling policy environment conducive to biodiversity mainstreaming in different landscapes and sectors, which will result in more stable support for biodiversity conservation and sustainable use activities.

124. To maximize sustainability the project will prioritize political and institutional articulation to be carried out through specific activities aimed at engaging stakeholders and obtaining political and institutional support to the SIBBr. Preliminary end user demands have been assessed during project preparation and a series of decision-making tools and services will be developed by the project to help in decision-making processes. In addition, demands will be continuously assessed and monitored and new tools and applications may be developed to fulfill specific demands that are not already met during project implementation. The project will develop a strong system of governance for SIBBr based on the principles of wide representation, transparency and legitimacy, and that responds to issues identified during institutional and political articulation. The SIBBr will provide free access to information ensuring a wide take-up and sustained public support in addition to increasing capacity for taxonomy, systematic and biodiversity conservation in diverse institutions.

125. Brazil has put in place a strong legal framework for the governance of biodiversity information that will contribute to the sustainability of project results. For example, a recent deliberation (CONABIO no. 53, 26/8/2008) outlined guidelines and strategies for the modernization of Brazilian biological collections and the consolidation of integrated systems of biodiversity information. In another example, PPBio established procedures for the generation and dissemination of biodiversity knowledge in parallel with different sectors of society. MCT is responsible for the management of databases and metadata for educational, cultural, scientific and communication purposes. MCT guidelines describe the establishment of norms, patterns and procedures for the management of information systems and databases, revision and updating of annual data policy, and the establishment of norms for data security, accessibility, quality, longevity, interoperability, integrity, storage, analysis, replication, and data publication. A final example is the draft law (*Lei 1120/2007*) that defends the free access to the production of knowledge by undergraduate and post-graduate courses and research funded from public resources.

126. The technical sustainability of the SIBBr is dependent on the maintenance and management of the national communications infrastructure and interoperability with other systems. The SIBBr will use the high-speed optical transmission Internet infrastructure provided by RNP, which will guarantee high availability, security and stability. As mentioned in section 2.6 the RNP foresees important continuous investments in infrastructure during the next 5 years in parallel with the project. Interoperability is one of the key SIBBr features and will also be important to ensure articulation with existing and newly developed databases.

127. Long-term financial sustainability is important for the continued development and use of the SIBBr beyond the initial funding period. To achieve this objective the project will assess and put in place the following mechanisms: (i) diversification of project funding agents; (ii) development of new public-private partnerships and partnerships with financial institutions; (iii) post-implementation of specific sectoral funding; (iv) analysis of gaps in the portfolio of funding opportunities; (v) development of minimal and ideal cost scenarios; (v) development of a transparent and accountable financial management system. The financial management of the SIBBr at the end of the initial five-year project cycle will therefore consist of continued MCT funding, in addition to funding from a number of potential sources identified during project implementation.

3.9. Replication

128. The project aims to provide information to support decision-makers in making better executive option choices about the conservation and sustainable use of globally important biodiversity in Brazil. Replicability of project lessons and experiences will be guaranteed on two levels. First, by coordinating, sharing, and mainstreaming information, and by promoting appropriate policies, this project will ensure that lessons learned through different initiatives can be replicated throughout Brazil. Second, by participating in international initiatives like IABIN, EoL and the CBD, the experience of Brazil in creating a national, multisectoral biodiversity network will be shared with other countries and can be used in similar initiatives. The SIBBr will serve as a strong model for other countries that, in response to recommendations and obligations of the CBD, wish to develop national biodiversity information systems. Moreover, every effort is being made to encourage interoperability and transfer of knowledge and technology between stakeholders both within the country and the wider international community.

129. The project will specifically benefit other countries that have very high biodiversity richness and have not yet developed a consolidated and integrated national biodiversity information system. The project to implement SIBBr will be a model of intervention capable of integrating diverse scenarios and components related to monitoring and access of biological collections. The conception of the project is targeted at challenges related to the definition of policy, management of collections, incentives to increase capacity, and the mainstreaming of biodiversity data to benefit strategic social actors in the process of decision-making. In this context, a strategic map of actions, tools and results consolidated during the life cycle of the project will serve as a robust framework for similar initiatives.

3.10. Public awareness, communications and mainstreaming strategy

130. The project will disseminate information on a regular basis among the different stakeholders involved in the project through a dissemination strategy to be developed under Output 3.5. The dissemination strategy will cross-cut all activities carried out under Outcome 3 with the objective to further guarantee the uptake of the biodiversity information by the relevant policy instruments and legislative frameworks. The dissemination strategy will target potential users in the private, non-governmental and governmental sectors at federal, state and local levels. This strategy will further strengthen and broaden the already existing link between the knowledge made available through database information management and the decision making process for biodiversity conservation in relevant productive sectors.

131. The targeted dissemination strategy will benefit from the development of specific products and will carry out carefully focused awareness-raising and training events focused on the priority end-users (decision makers). The overall objective of the dissemination strategy will be to facilitate a change in culture leading to the mainstreaming of biodiversity into diverse sectors. The dissemination products will be made available to sectoral forums, Environment Secretariats, Science and Technology Secretariats, etc. Dissemination products about SIBBr will also be made available to organizations from other sectors such as the São Paulo State Federation of Industries (FIESP), National Confederation of Industries (CNI), Forest Stewardship Council (FSC), etc. Project results and lessons learnt will be identified and disseminated on a regular basis through the different information sharing

mechanisms. The project will participate whenever appropriate in UNEP sponsored networks and events, and any other network that may be of benefit for the project's objective.

132. The expected results of implementing the dissemination strategy include an increase in the visibility, content, accessibility and use of the SIBBr, thereby promoting better use of the available information for conservation of biodiversity by decision makers. Ultimately, it is hoped that a change of culture will occur among end-users, especially those from the productive sectors, in relation to the perception of the benefits, value and potential uses of biodiversity information.

3.11. Environmental and social safeguards

133. The Project has been designed to achieve positive environmental and social impacts. The project will operate to the required GEF standards and is consistent with the environmental Brazilian policy and legal frameworks including the National Environmental Policy, the NBSAP and the MCT Strategic Plan, among other instruments. The project will contribute to implementation of plans and programmes such as PPBio; the National Protected Areas Plan; Priority Areas for Conservation; Sustainable Use and Benefit Sharing of Biodiversity and the PAC. Moreover, the project will be in full compliance with all relevant national and international legislation and agreements.

134. The project will promote an enabling environment for development of the SIBBr and for decision makers to make the best use of the information available through: enhanced collaboration among key stakeholders and participatory mechanisms and incentives to engage them in project implementation; capacity building and awareness. The decision-making tools to be developed respond to demands assessed during project preparation and will provide an added value to the range of conservation instruments currently in use in Brazil, thereby contributing to conservation of global biodiversity. The project envisages continuous assessment and updating of decision-making needs and requirements therefore ensuring that additional tools that may be developed in the future are aligned with biodiversity conservation priorities.

135. One of the key issues taken into account is access to sensitive biological data such as geo-referenced coordinates for critically endangered species or data on the distribution of exploitable species. This eventuality has been fully considered in the design of the SIBBr and will be carefully controlled by ensuring that data providers retain full control over all of their data, including the capacity to restrict access to sensitive data to different categories of users. Guidelines on this issue will be developed and validated with data providers. However, data in this category is envisaged to be a tiny fraction of the total data, the rest of which will be freely available.

136. Stakeholder participation will constitute an important mechanism to provide social safeguards and national cross-sectoral stakeholder participation from the governmental, NGO and private sector has been a priority during the project design to ensure diverse ownership and governance of the project. One of the key attributes of the SIBBr project and an important prerequisite for its success will be intensive networking and the establishment of collaborative partnerships. One of the main project sub-components is the creation of "a dissemination strategy targeted at potential users in the private, non-governmental and governmental sectors at federal, state and local levels" (Output 3.5) in order to ensure the successful uptake of project outputs at all levels. Mechanisms to provide all partners and stakeholders with information on project progress and to capture their feedback for consideration will ensure a continuous assessment of the ongoing work of the project against the national and regional social and environmental backdrop. Overall, this participatory approach will provide the mechanism to address concerns and changing points of view within the stakeholder community throughout the course of the project and to make necessary adjustments.

137. The project will put in place an M&E system with the objective to provide accurate and timely information and feedback on project implementation and performance to enable project management to make decisions that address issues as they arise, thus ensuring that the above conditions are met during project implementation and contributing to achievement of project outcomes and objective.

SECTION 4: INSTITUTIONAL FRAMEWORK AND IMPLEMENTATION ARRANGEMENTS

Implementing Agency (UNEP)

138. UNEP, as an implementing Agency of the GEF, will be responsible for overall project supervision to ensure consistency with GEF and UNEP policies and procedures and will provide guidance on linkages with related UNEP and GEF-funded activities. The Division of GEF Coordination (DGEF) will monitor implementation of the activities undertaken during the execution of the project; it will be responsible for clearance and transmission of financial and progress reports to GEF. UNEP will provide the overall coordination and ensure that the project is in line with UNEP Medium-Term Strategy and Work Program, as approved by the UNEP Governing Council.

Executing Agency

139. MCT, as the Executing Agency, will be responsible for the implementation of the project in accordance with the objectives and activities outlined in Section 3. MCT will work closely with UNEP and provide free access to all relevant information so as to allow the organization to fulfill its responsibilities to the GEF. MCT responsibilities will include the following:

- Jointly selecting with UNEP the staff for the Project Management Unit;
- Planning for and monitoring the technical aspects of the project, and monitoring progress benchmarks and outputs;
- Actively participating in all relevant project activities where appropriate;
- Adopting, during the course of the project, the systems, programs and tools developed by the project to ensure sustainability of the project outcomes;
- Play an active role in coordinating with other stakeholders throughout the project;
- Preparation and submission of periodic progress reports, and regular consultations with beneficiaries and contractors;
- Maintaining a separate project account for the accountability of project funds;
- Ensuring advanced funds are used in accordance with agreed work plans and project budget;
- Preparing, authorizing and adjusting commitments and expenditures; ensuring timely disbursements, financial recording and reporting against budgets and work plans;
- Managing and maintaining budgets, including tracking commitments, expenditures and planned expenditures against budget and work plan; and,
- Maintaining productive, regular and professional communication with UNEP and other project stakeholders to ensure the smooth progress of project implementation.

140. MCT will establish a Project Management Unit (PMU) that will be responsible for day-to-day management of the project. The PMU will consist of appropriate professional and support staff and the staff of this team may be augmented through secondment of national staff to the project. The PMU will be staffed with the following professional and support staff: (i) Project Coordinator; (ii) Component Managers; (iii) M&E Specialist; (iv) Project Administrative/Financial Assistant; (v) Project Secretary; and a (v)i Communications Assistant. The GEF will fund the positions of Project and Component Coordinators while the remaining positions will be co-funded. Appendix 10 includes the project organization chart including the PMU staff. Appendix 11 includes the Terms of Reference of key PMU staff. The responsibilities of the PMU will include the following:

- Achievement of the project outcomes and objective;
- To manage day-to-day implementation of the project, coordinating project activities in accordance with the rules and procedures of UNEP-GEF and based on the general guidance provided by the Project Steering Committee;
- To provide overall project coordination and M&E;
- To provide technical input as appropriate into the outcomes;
- To coordinate with the project stakeholders and regional/national programs of relevance to the project;
- To convene periodic Project Implementation Meetings in order to review progress in implementing project workplans;

- To ensure, together with UNEP that specified tasks are outsourced to suitable sub-contracted Technical Assistance Service Providers or national and international consultants through competitive bidding processes. PMU responsibilities in this regard include development of bidding documents and terms of reference;
- To organize project-level meetings and workshops, e.g., inception workshop, Project Steering Committee (PSC) meetings, etc.;
- To work closely with the UNEP Regional Office and UNEP Brazil Office in organizing and providing technical and logistic support and coordination to all missions and assignments by international and national consultants; and,
- To prepare overall project reporting.

141. A Project Steering Committee (PSC) will provide political and strategic guidance for the project. The PSC will meet at least once a year and will be responsible for overseeing and approving annual work plans, budgets, and other strategic decisions. Membership of the PSC will include UNEP, MCT and other key institutions that have a strategic or practical interest in the project (e.g. MMA, CRIA, RNP, SEPED). Members of the international bioinformatics community (e.g. GBIF) and the IABIN project may be invited to participate in PSC meetings to ensure that SIBBr is fully integrated and compatible with existing global initiatives.

142. Due to the highly technical nature of the project there will be the need for more targeted support and advice and, when the need arises, separate committees or working groups will be created by the executing agency to give advice on specific scientific and technical issues. Finally, to ensure long-term stability and sustainability, a robust and representative governance structure will be developed during the implementation of the project.

143. In order to accord proper acknowledgement to GEF for providing funding, a GEF logo should appear on all relevant GEF project publications, including among others, project hardware and vehicles purchased with GEF funds. Any citation on publications regarding projects funded by GEF should also accord proper acknowledgment to GEF.

SECTION 5: STAKEHOLDER PARTICIPATION

144. The main goal of SIBBr is to ensure data driven policy design and implementation by facilitating and mainstreaming biodiversity information into decision-making and policy development processes. Stakeholder involvement is central to the success of all three components of the project. First, in order to effectively collect, collate, organize and qualify Brazilian biodiversity data it is necessary to collaborate with numerous data providing institutions and organizations in Brazil and beyond the country's borders. Second, Brazil already has organizations with considerable expertise in the design and implementation of biodiversity information systems and communication networks. The experiences and accumulated knowledge of these organizations will be of immense benefit in the implementation of the SIBBr. Finally, the project will benefit a diverse collection of end-users including individuals and organizations drawn from federal, state and municipal government, NGOs, and the private sector.

145. Many of these stakeholders have already been involved during the project's planning phase. Most notably, during the development of a set of guidelines and actions under the PPBio to support the development of the country's biological collections so that they can better attend the growing demands for biodiversity information⁴⁹. The proposed guidelines and actions were identified through collaboration between the Botanical Society of Brazil, Brazilian Society of Microbiology, Brazilian Society of Zoology, CRIA, and numerous experts from research bodies (national and international), universities and government institutes and form the basis of a considerable part of the current proposal. Key end-users have also been briefed and consulted during the development of the project.

⁴⁹ MCT (2006) Diretrizes e estratégias para a modernização de coleções biológicas brasileiras e a consolidação de sistemas integrados de informação sobre biodiversidade. PPBio.

Most notably, MCT conducted extensive consultations with other ministries (e.g. MPOG, MME, MIN, MMA-IBAMA, MAPA) that were identified as having a clear need for biodiversity information.

146. Many of the stakeholders identified above will continue to have a very active role during the implementation phase of the project as active participants, consultants, or members of the PSC. For example, SIBBr will draw heavily on the practical experience and technical expertise of CRIA in the design and implementation of the biodiversity information system. This important collaboration will ensure the rapid development of a fully functioning information system and will also provide strong basis for the involvement of data providing organizations that already contribute to the *speciesLink* initiative. Project design includes continuous coordination and articulation of stakeholders to ensure their engagement in project implementation. Lessons learnt within the framework of CRIA's *speciesLink* initiative have been incorporated in the project strategy, namely increased visibility of collections through information sharing, tools to help clean and add value to data, support to digitization and control over their data. All of these incentives have proven to facilitate participation and involvement of data providers. Furthermore, the targeted dissemination strategy will ensure the involvement of potential users from the private, non-governmental and governmental sectors at federal, state and local levels. This strategy will further strengthen and broaden the already existing link between the knowledge made available through database information management and the decision making process for biodiversity conservation in relevant productive sectors.

147. Another group of stakeholders with an important role in the project is the international community. As the GEF Implementing Agency, UNEP serves to support the design, implementation and evaluation of the project including the guidelines for eligibility and follow-up and will be on the PSC. Other important international stakeholders include international conservation NGOs such as WWF, CI and TNC who play a major role in biodiversity conservation and related activities in Brazil. The SIBBr will also utilize international expertise in biodiversity informatics and through the appointment of international experts to the PSC. Moreover, continuing efforts will be made to repatriate biodiversity data and aims to build on successful ongoing initiatives with the New York Botanical Garden, Missouri Botanical Garden, Smithsonian Institute, University of California's Museum of Vertebrate Zoology, Natural History Museum of Paris and the UK's Royal Botanic Gardens.

148. In the longer term, when a fully operational biodiversity information system and associated tools for visualization and analysis have been established, the SIBBr aims to incorporate a comprehensive group of data providers and benefit a diverse selection of end-users including government bodies, private companies, NGOs and the public. The system aims to provide free and easily accessible biodiversity data with the only restrictions applying to sensitive species and areas (such as endangered species with high trade value). These data will be an immensely valuable global resource that can be utilized in teaching, research, and advocacy by individuals and institutions around the world. The SIBBr will also provide valuable information for individuals or organizations in the private sector who seek to sustainably exploit the products and services derived from biodiversity.

SECTION 6: MONITORING AND EVALUATION PLAN

149. The project will follow UNEP standard monitoring, reporting and evaluation processes and procedures. Substantive and financial project reporting requirements are summarized in Appendix 8. Reporting requirements and templates are an integral part of the UNEP legal instrument to be signed by the executing agency and UNEP.

150. The project M&E plan (Appendix 7) is consistent with the GEF Monitoring and Evaluation policy. The Project Results Framework presented in Appendix 4 includes SMART indicators for each expected outcome as well as mid-term and end-of-project targets. These indicators along with the key deliverables and benchmarks included in Appendix 6 will be the main tools for assessing project implementation progress and whether project results are being achieved. The means of verification and the costs associated with obtaining the information to track the indicators are summarized in Appendix 7. Other M&E related costs are also presented in the Costed M&E Plan and are fully integrated in the overall project budget.

151. The M&E plan will be reviewed and revised as necessary during the project inception workshop to ensure project stakeholders understand their roles and responsibilities vis-à-vis project monitoring and evaluation. Indicators and their means of verification may also be fine-tuned at the inception workshop. Day-to-day project monitoring is the responsibility of the project management team but other project partners will have responsibilities to collect specific information to track the indicators. It is the responsibility of the Project Manager to inform UNEP of any delays or difficulties faced during implementation so that the appropriate support or corrective measures can be adopted in a timely fashion.

152. The project Steering Committee (PSC) will receive periodic reports on progress and will make recommendations to UNEP concerning the need to revise any aspects of the Results Framework or the M&E plan. Project oversight to ensure that the project meets UNEP and GEF policies and procedures is the responsibility to the Task Manager in UNEP-GEF. The Task Manager will also review the quality of draft project outputs, provide feedback to the project partners, and establish peer review procedures to ensure adequate quality of scientific and technical outputs and publications.

153. At the time of project approval 100% percent of baseline data is available. Any possible baseline data gaps will be identified and addressed during the first year of project implementation. Project supervision will take an adaptive management approach. The Task Manager will develop a project supervision plan at the inception of the project, which will be communicated to the project partners during the inception workshop. The emphasis of the Task Manager supervision will be on outcome monitoring but without neglecting project financial management and implementation monitoring. Progress vis-à-vis delivering the agreed project global environmental benefits will be assessed with the PSC at agreed intervals. Project risks and assumptions will be regularly monitored both by project partners and UNEP. Risk assessment and rating is an integral part of the Project Implementation Review (PIR). The quality of project monitoring and evaluation will also be reviewed and rated as part of the PIR. Key financial parameters will be monitored quarterly to ensure cost-effective use of financial resources.

154. A mid-term management review or evaluation will take place on PY3 as indicated in the project milestones. The review will include all parameters recommended by the GEF Evaluation Office for terminal evaluations and will verify information gathered through the GEF tracking tools, as relevant. The review will be carried out using a participatory approach whereby parties that may benefit or be affected by the project will be consulted. Such parties were identified during the stakeholder analysis (see section 2.5 of the project document). The PSC will participate in the mid-term review and develop a management response to the evaluation recommendations along with an implementation plan. It is the responsibility of the UNEP Task Manager to monitor whether the agreed recommendations are being implemented.

155. An independent terminal evaluation will take place at the end of project implementation. The Evaluation and Oversight Unit (EOU) of UNEP will manage the terminal evaluation process. A review of the quality of the evaluation report will be done by EOU and submitted along with the report to the GEF Evaluation Office not later than 6 months after the completion of the evaluation. The standard terms of reference for the terminal evaluation are included in Appendix 9. These will be adjusted to the special needs of the project.

156. The GEF tracking tools are attached as Appendix 15. These will be updated at mid-term and at the end of the project and will be made available to the GEF Secretariat along with the project PIR report. As mentioned above the mid-term and terminal evaluation will verify the information of the tracking tool.

SECTION 7: PROJECT FINANCING AND BUDGET

7.1. Overall GEF project budget

Project Outcomes	GEF					
	PY1	PY2	PY3	PY4	PY5	Total
Outcome 1: The information contained in Brazilian biological centers and networks has been organized, qualified and integrated into the Brazilian Biodiversity Information System - SIBBr.	981.100	739.300	856.500	606.500	550.500	3.733.900
Total Outcome 1	981.100	739.300	856.500	606.500	550.500	3.733.900
Outcome 2: Institutional and taxonomic capacities are strengthened to ensure continuous uploading and updating of information into the SIBBr	0	0	0	0	0	0
Total Outcome 2	0	0	0	0	0	0
Outcome 3: Enabling framework to manage, distribute and use qualified information at federal and state level decision making for conservation of globally significant biodiversity.	234.800	781.800	1.145.300	722.464	822.464	3.706.828
Total Outcome 3	234.800	781.800	1.145.300	722.464	822.464	3.706.828
Project Management	146.400	146.400	146.400	146.400	146.400	732.000
Total Project Management	146.400	146.400	146.400	146.400	146.400	732.000
TOTAL GEF	1.362.300	1.667.500	2.148.200	1.475.364	1.519.364	8.172.728

7.2. Project co-financing

Project Outcomes	GEF	Cofinancing					
		PY1	PY2	PY3	PY4	PY5	Total
Outcome 1: The information contained in Brazilian biological centers and networks has been organized, qualified and integrated into the Brazilian Biodiversity Information System - SIBBr.	3.733.900	4.217.000	1.620.000	1.127.000	1.117.000	1.117.000	9.198.000
Total Outcome 1	3.733.900	4.217.000	1.620.000	1.127.000	1.117.000	1.117.000	9.198.000
Outcome 2: Institutional and taxonomic capacities are strengthened to ensure continuous uploading and updating of information into the SIBBr	0	1.125.000	1.189.000	1.179.000	1.139.000	1.139.000	5.771.000
Total Outcome 2	0	1.125.000	1.189.000	1.179.000	1.139.000	1.139.000	5.771.000
Outcome 3: Enabling framework to manage, distribute and use qualified information at federal and state level decision making for conservation of globally significant biodiversity.	3.706.828	243.333	1.016.083	1.009.417	824.417	698.036	3.791.286
Total Outcome 3	3.706.828	243.333	1.016.083	1.009.417	824.417	698.036	3.791.286
Project Management	732.000	284.143	249.443	241.443	230.343	234.343	1.239.714
Total Project Management	732.000	284.143	249.443	241.443	230.343	234.343	1.239.714
TOTAL GEF	8.172.728	5.856.476	4.061.526	3.543.860	3.297.760	3.240.379	20.000.000

7.3. Project cost-effectiveness

157. Presently the Brazilian government has 36 ministries charged with the articulation and implementation of public policy. Many of them require information on Biodiversity because they share the responsibility about the creation, approval, financing, execution or monitoring of initiatives and programs that may impact the environment. Through this proposal, the Science and Technology Ministry intends to coordinate the creation of a mechanism to concentrate said demands and mainstream the knowledge about Biodiversity within the government and private sectors.

158. Brazil does not possess a compartmentalized infrastructure to store and grant access to the data that is produced in Biodiversity. Many data produced never reach institutional data banks or are even published in print. In addition, information systems and data banks that may be accessed do not make integrated information available in formats that would be adequate to fill the existing demands. Therefore the present capacity to recover existing Biodiversity information and to integrate it in public sectoral policy is insufficient, since the information is fragmented and dispersed; the government sectors have problems to identify the best sources to access information; the information retrieval process is slow and expensive and the data base utilized is fragile because it is generally based on easily retrievable information.

159. There are several possibilities to modify this scenario. One option would be the creation of dissemination mechanisms for suppliers of Biodiversity information. That mechanism would reduce the distance between suppliers of the information and the decision makers and would increase the latter's capacity to identify the best information sources. Another alternative would be to promote economies of scale for the present information retrieval process that would be mainly based on the consultation of specialists. That economy of scale would reduce the fragility of the database but would turn the appropriation process even longer and costlier. In addition, both options presented would contribute little to ensure that the information made available could really be used, since there would be no articulate action to integrate it and adapt it to the existing demands. A third option would be to

promote economies of scale for the institutional data repository creation process. This option would increase the number of suppliers and the quality of the available information, but it would take even longer and be more expensive, since the same type of investment would have to be repeated in the different institutions. This option would also fail to increase the possibilities that information be used because the need to integrate and adapt it to existing demands would still remain. The option selected by the project is that of promoting synergies to strengthen institutional capacities and create an infrastructure of national scope, based on several existing initiatives. This option appears to be the most effective because it would gather information suppliers in one and the same source; allow the concentration and improved identification of demands; promote economies of scale for the quantity of available information; allow the integration and management of information and reduce the total cost of accessing information as well as the need to replicate investments.

160. Cost-effectiveness has been taken into account in project design. Components 1, 2 and 3 are interlinked and together aim at overcoming institutional, cooperation, technical and socioeconomic barriers to effective biodiversity information management in Brazil. **Component 1** will consolidate the infrastructure, instruments, tools, and technology required to qualify, gather and make the biodiversity information contained in the resources of the country's biological collections freely available online. This will significantly reduce long-term costs of information retrieval and use by front-line decision makers by reducing the reliance on meetings of experts. One of the main products of this component, the creation of the Brazilian Biodiversity Information System (SIBBr), will link and integrate existing national biodiversity information systems, biological and other databases and will allow users to extract relevant information for use in a wide range of activities including conservation, land use planning, exploitation of natural resources, environmental licensing, ecotourism, etc. The SIBBr represents a very cost-effective technical solution to the problem of providing high quality biodiversity information to diverse end-users in a form that they can easily use. The ultimate impact of the SIBBr will be seen in more sustainable patterns of production, consumption and an increase in well-being. Another important activity within **component 1** that will contribute to cost-effectiveness is the enhancement of stakeholder and political articulation at all levels of government organization (federal, state, and municipal). The resulting increase in institutional cooperation among data providers, end-users and other stakeholders will lead to a strong shared long-term vision for the development and use of the SIBBr and a higher level of sustainable management of natural resources in Brazil as a whole.

161. **Component 2** focuses on strengthening of institutional and taxonomic capacities to ensure continuous uploading and updating of information into the SIBBr. This will result in an expanded national biodiversity knowledge base, and a strengthened long-term capacity for data acquisition and management through well-managed biological collections with increased expertise. This is a cost effective solution for ensuring the long-term utility of SIBBr and establishing a strong and cohesive network of modern biological collections that are responsive to the information requirements of society.

162. The **third component** of the project is focused on the management of biodiversity information and how to elaborate products and services that will meet the requirements of society and allow decision-makers to establish policies that integrate biodiversity conservation and sustainable use objectives into the operations of the productive sectors. This will be achieved through a combination of the development of products and services that genuinely facilitate decision making and policy development, training of end users in using the system, and a strong dissemination strategy that targets potential users in the private, non-governmental and governmental sectors at federal, state and local levels. These activities will ensure that the SIBBr is widely used and that the anticipated benefits in terms of cost savings and enhanced environmental management objectives are met.

163. This coordinated strategy of managing and utilizing biodiversity information, while simultaneously strengthening the infrastructure and capacity of institutions that produce the information, will ensure that the project is cost effective and sustainable. Moreover, the SIBBr will be designed to be flexible and responsive to changes in information and communications technology so that the benefits of the system continue to be gained life span of the project. More generally, the project will be cost effective because it builds upon existing technology and infrastructure,

speciesLink, Biota/Fapesp and RNP, and on the political commitment of the Brazilian Government to develop a coordinated information system that will better allow the mainstreaming of biodiversity into the productive sectors. The lessons learnt from these relevant past initiatives considerably augment the project's potential for long-term sustainability of results and replication. Moreover, a long-term funding model for the SIBBr will be developed during the project life cycle to ensure financial sustainability and that the benefits of the initiative extend into the future.

APPENDICES

- Appendix 1: Budget by project components and UNEP budget lines**
- Appendix 2: Co-financing by source and UNEP budget lines**
- Appendix 3: Incremental cost analysis**
- Appendix 4: Results Framework**
- Appendix 5: Workplan and timetable**
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- Appendix 11: Terms of Reference**
- Appendix 12: Co-financing commitment letters from project partners**
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Appendix 1: Budget by project components and UNEP budget lines
(Excel file)

Appendix 2: Co-financing by source and UNEP budget lines
(Excel file)

Appendix 3: Incremental cost analysis

A. General Aspects

1. Brazil is one of the most bio-diverse countries in the world accounting for approximately 13 percent of the world's terrestrial biota and containing between 170,000 and 210,000 described species. Of course, there are also many species yet to be discovered and described, especially in the vast tropical forests of the Amazon and the real figures for total species richness have been estimated to be somewhere between 1.4 to 2.4 million species. The marine habitat of Brazil, though less diverse and with lower rates of endemism still contains vast numbers of fish and invertebrates some of which are threatened with over-exploitation.

2. This biological richness, however, is threatened by biodiversity loss driven by habitat destruction and fragmentation, invasive species, over-exploitation and pollution. Specifically, widespread agricultural expansion (including forestry and conversion to pastures), road construction, and mining have been particularly important in driving population decline and species disappearance. Furthermore, a second set of factors such as hunting, overexploitation of timber and fuel wood, illegal trading of plants and animals, chemical pollution, oil exploration, hydroelectric projects, and unsustainable tourism are locally significant. The root causes of biodiversity loss in Brazil are related to demographic change, inequality and poverty, macroeconomic policies, social changes, and unsustainable development.

3. Effective biodiversity conservation requires that governments and other policy-making bodies make rational decisions about land-use and management based on the most accurate and up-to-date information. Providing such information in a form that is accessible and policy-relevant is a major challenge. Brazil is a huge country with vast stores of biodiversity, a wide range of biomes, and a long history of collecting biological information. However this information is currently stored in countless different institutions, in different formats and media, and is often not available in forms that can easily be accessed and used by politicians, policy-makers and environmental managers. The practical consequences of limited access to relevant biodiversity information can be severe, potentially leading to biased or delayed progress and unwise conservation or natural resource use decisions

4. An effective national biodiversity information system capable of improving decision making processes to counteract the drivers of biodiversity loss and help revert the current trends must have the ability to collate, compare, integrate and manage raw biodiversity data and present it in a form that genuinely informs and facilitates the decision-making process, which is currently absent. A number of technical, financial, and institutional barriers must be overcome to achieve this objective, namely: (i) barriers to the organization, qualification and integration of information contained in Brazilian biological centers and networks; (ii) barriers to strengthening institutional and taxonomic capacities; and (iii) barriers to effective information management and use.

5. Within this context, the Baseline Scenario identifies ongoing and planned initiatives that are relevant to the project's outcomes over the proposed 5-year life of the project (project boundary). The GEF Alternative consists of the Baseline in addition to the costs associated with the necessary incremental activities to achieve the project objective. The Incremental Cost is the difference between the costs of the GEF Alternative and the Baseline Scenario.

B. The Baseline Scenario

6. Brazil has taken several initiatives to conserve its biodiversity but these are isolated efforts by a number of institutions and, as such, need to be streamlined and coordinated. Technical and scientific cooperation and information exchange are increasingly perceived as necessary and are currently the most important paradigm on conservation and sustainable use of biodiversity. Without a major investment, little will change in the context of mainstreaming biodiversity information. As in many other countries the rapidly growing quantity of raw data is a positive development, but for policy-making processes these data and information have limited use because of difficulties associated with access and format. The baseline entails an array of organizations that continue to generate information that is hardly used by policy makers.

7. Under the 'business as usual' scenario Brazilian institutions will continue to generate large amounts of information on biodiversity, some of which will be made available through institutional websites or links to regional, national, or global biodiversity information networks. Some of the existing biodiversity information that is not yet available online will be digitized but the rate of conversion and taxonomic coverage will continue to be largely dependent upon institutional funding and prioritization. Biodiversity information will continue to be produced in a wide variety of formats, many of which are not interoperable. New initiatives will be unlikely to benefit from knowledge generated from past activities, and synergies between projects will continue to be missed. The RNP network will continue to provide excellent infrastructure support for academic and public institutions but will not be fully utilized to improve access and use of Brazilian biodiversity information.

8. The Ministry of Education's body for the Coordination of Improvement of Higher Education Personnel (CAPES) and the MCT coordinated National Scientific and Technological Research Council (CNPq) and the Research and Project Financing Agency (FINEP), will continue to invest in the National Academic Cooperation Program by supporting network projects and capacity building actions. These actions are not enough to create a coordinated capacity at the national level to attend the demands for information from stakeholders. The use of biodiversity information by stakeholders will thus be modest. Under this scenario, PPBio will continue to support about 10 networks located in Amazonia and the Semi-Arid regions, but the programme will not have the capacity to expand activities into other biomes and will not be able to support the increase in the number of institutions entering the networks within those regions.

9. National and local government policy makers, environmental planners, private companies, and key decision makers will continue to have restricted access to relevant biodiversity information and will continue making decisions based on the knowledge of individuals without the support of a good data infrastructure. When biodiversity data are available, they are normally incomplete and often not in an adequate format. This means that primary data will continue to be unavailable or ineffectively used to inform important decisions about conservation, land use and natural resource management. Moreover, the continued lack of a coordinated, effective system of biodiversity information management will continue to impede the mainstreaming of biodiversity into other productive sectors. Decision makers will lack both awareness of the importance and value of biodiversity for their sector, and the effective tools that would facilitate the integration of biodiversity data into the wider context of environmental decision-making.

10. In summary, the baseline scenario would generate benefits, especially in the realm of biodiversity information, and would likely have local benefits in terms of limited biodiversity conservation in specific geographic areas. However, due to the fragmented nature of mainstreaming initiatives, the lack of coordination and synergies among different activities and between the public and private sectors, the weaknesses of certain institutions, and the incomplete nature of information generated and shared, global conservation benefits would be limited. Under the baseline scenario, biodiversity concerns are unlikely to be substantially mainstreamed into different productive sectors, and information generated will be insufficient or inappropriate for informing biodiversity-related policies.

11. Within the afore-mentioned framework were identified the ongoing and planned initiatives that comprise the Baseline Scenario, taking into account several criteria, namely: (a) relevance of the initiative to the three technical outcomes of the project, (b) initiatives have to be under implementation within the Project's life span of 5 years, and (c) they have to be developed within the project's proposed scope (project boundary). Furthermore, several categories of components and activities were considered for inclusion of the initiatives in the baseline assessment and their respective costs, namely: (a) biodiversity databases and information systems, (b) communications infrastructure and networks, (c) taxonomy-related initiatives (d) capacity-building.

12. The Project Baseline has assessed the existence of a wide array of baseline initiatives; however due to difficulties in accessing financial information on many of them (dispersion of initiatives throughout the country, many very small sized initiatives and time period available during project preparation) only those considered as most representative have been taken into account and are presented in the following table by project outcome:

Table 1: Baseline assessment (amounts in US\$)

Source of Funds/ Type of expenditures	Current and planned investments 2009-2014	Total
<i>Outcome 1: The information contained in Brazilian biological centers and networks has been organized, qualified and integrated into the Brazilian Biodiversity Information System - SIBBr.</i>		
BIOTA/FAPESP (CRIA-biodiversity information databases and networks)	4,765,742	
RNP (Investments in communication network)	234,000,000	
Sub-total outcome 1	238,765,742	238,765,742
<i>Outcome 2: Institutional and taxonomic capacities are strengthened to ensure continuous uploading and updating of information and global utilization.</i>		
Public Budget/MCT: Museu Goeldi: Field work, management, training, facilities and maintenance and updating of database	2,259,887	
Public budget and projects financed by other funding sources: Herbario do Jardim Botânico do Rio de Janeiro (MMA): taxonomy-related activities: training, field work, improvement of collections	2,711,864	
Public Budget: INPA (MCT): taxonomy-related activities: training, field work, improvement of collections	2,338,883	
UFRJ Budget/ Vitae Project/FINEP/MEC/congress ammendments/Ministry of Culture: Scientific collections of the National Museum (UFRJ/MEC): taxonomy-related activities: training, field work, improvement of collections	10,169,491	
Sectoral Funds FNDCT/MCT CGEB/SEPED/MCT Programmes: research projects	42,937,853	
Pluri-annual plan 2007-2011 CGBE/SEPED/MCT Programmes: taxonomy-related activities: training, field work, improvement of collections, research	40,254,237	
Sub-total outcome 2	100.672.215	100.672.215
<i>Outcome 3: Enabling framework to manage, distribute and use qualified information at federal and state level decision making for conservation of globally significant biodiversity.</i>		
Pluri-annual plan 2007-2011: Costs associated with production of maps, information for environmental licensing, or similar	2,600,000	
Sub-total outcome 3	2,600,000	2,600,000
Total		342,037,957

C. The GEF Alternative

13. If the current scenario persists and the identified barriers are not removed, biodiversity concerns are unlikely to be substantially mainstreamed into different productive sectors, and information generated will be insufficient or inappropriate for informing biodiversity-related policies, hence national and local government policy makers, environmental planners and key decision makers will continue to have restricted access to relevant biodiversity information and will continue making decisions based on the knowledge of individuals without the support of a good data infrastructure.

14. The proposed long-term solution is to provide Brazilian decision-makers with authoritative, strategic and timely information to support the development and implementation of policies and strategic planning decisions and to make better executive option choices about the conservation of globally important biodiversity in Brazil.

15. The project *Improving Brazilian Capacity to Conserve and Use Biodiversity through Information Management and Use* has the objective of ensuring data-driven policy design and implementation by facilitating and mainstreaming biodiversity information into decision-making and policy development processes. To such effect the project will generate the following three outcomes: (i) The information contained in Brazilian biological centers and networks has been organized, qualified and integrated into the Brazilian Biodiversity Information System – SIBBr; (ii) Institutional and taxonomic capacities are strengthened to ensure continuous uploading and updating of information into the SIBBr; (iii) Enabling framework to manage, distribute and use qualified information at federal and state level decision making for conservation of globally significant biodiversity.

16. The GEF Alternative will: (i) Expand the activities of PPBio into the Atlantic Forest and Cerrado biomes with an emphasis on conserving globally significant biodiversity; (ii) Support the increase in the number of institutions contributing to the networks currently working within the Amazonian and Semi-Arid regions; (iii) Create networks that will integrate and be interoperable with existing national and international initiatives; (iv) Enlarge, consolidate and improve the biodiversity information base; (v) Improve access to the scientific knowledge on biodiversity generated within the country; (vi) Create an environment that is conducive to knowledge management; (vii) Apply and disseminate high quality scientific information in government sectors, in particular to decision-makers and managers. GEF funds will be used to enhance and expand the global significance of existing activities. This will allow for improvements in existing actions, making critical adjustments, and creating opportunities for new globally significant biological data activities. GEF funds under the project coordination component will be used to monitor project progress and impact, and to encourage participation of all stakeholders (international, national and local) throughout all stages of the project.

17. Global benefits will be accrued through: (i) Better national decision making processes applied to biodiversity conservation and use; (ii) Enhanced exchange of information relevant to biodiversity and sustainable use of globally important biodiversity in Brazil; (iii) Greater understanding and better decision-making in the conservation and sustainable use of Brazilian biodiversity; (iv) Mainstreaming biodiversity information about globally important topics and issues associated with the natural environment (such as land-use planning and ecosystem management, sustainable use of natural resources, control of invasive pest species, the trade in endangered species, and the emergence of new epidemiologies) into global biodiversity information systems such as the GBIF and the Encyclopedia of Life (EoL). (v) A robust model for the development and implementation of a national level biodiversity information system, elements of which can be adopted by other nations (especially large biodiverse countries in the developing world) seeking to gain similar benefits. In this manner, Brazilian efforts to positively influence production, land-use and environmental management through more effective biodiversity information management and use will have a significant positive impact on the 13% of global biodiversity that is found within Brazil's borders and will also have positive benefits for global environmental systems in which Brazilian ecosystems play a major role.

D. Incremental Cost Table

18. The incremental costs and benefits of the Project are presented in Table 2 below. The total baseline estimate is US\$342,037,957. The incremental cost of the GEF Alternative amounts to an estimated US\$370,210,685. The incremental cost necessary to achieve the Project objective and corresponding global benefits is US\$28,172,728 of which US\$8,172,728 (29%) constitute the sum requested to the GEF. Co-financing amounts to US\$20,000,000 (71%).

Table 2: Incremental cost matrix

Outcome	Baseline	Alternative	Increment
<p><i>Outcome 1:</i> The information contained in Brazilian biological centers and networks has been organized, qualified and integrated into the Brazilian Biodiversity Information System - SIBBr.</p>	<p>Brazil has initiated the development of information systems and networks in an effort to counteract the current costly and long decision making processes based on ad-hoc expert meetings. Such initiatives include: (i) the <i>speciesLink</i> system, (ii) databases and information systems developed by the Ministry of Environment and its institutes (IBAMA and ICMBio); (iii) SinBiota in Sao Paulo, (iv) The FloResCer project for the Center-West and Tocantins. These efforts are however still geographically limited and primarily target the scientific community. Existing information systems lack the ability to collate, compare, integrate and manage raw biodiversity data and present it in a form that genuinely informs and facilitates the decision-making process.</p>	<p>The Brazilian Biodiversity Information System – SIBBr will consolidate the infrastructure, instruments, tools, and technology required to qualify, gather and make the biodiversity information contained in the resources of the country’s biological collections freely available online. Data providers will benefit from increased institutional visibility, data cleaning, and added value to data through integration with other databases. Data users, including decision makers will benefit as more data will be made available and will become traceable through time. The SIBBr will make available authoritative, strategic and timely information to support the development and implementation of policies and strategic planning decisions in regard to the conservation and use of globally important biodiversity in Brazil.</p>	
	<p>Cost: US\$238,765,742</p>	<p>Cost: US\$251,697,642</p>	<p>GEF: US\$3,733,900 Co-financing: US\$9,198,000 Total: US\$12,931,900</p>
<p><i>Outcome 2:</i> Institutional and taxonomic capacities are strengthened to ensure continuous uploading and updating of information and global utilization.</p>	<p>Large amounts of biodiversity data are held in various biological collections, government bodies, research institutions, universities and the private sector. However, despite this long tradition of biological research the enormous size and mega-diverse nature of the country means that, when considered as a whole, biodiversity data are geographically and taxonomically incomplete. Knowledge gaps are particularly acute for relatively poorly studied taxa such as arthropods and for remote regions where there have been few formal surveys. Other constraints include limited funding for the maintenance and development of biological collections; poor infrastructure of many biological collections; and</p>	<p>An improved framework to strengthen taxonomic capacities through: (i) investment in qualified human resources in systematics, taxonomy and curatorship; (ii) modernization and consolidation of biological collections by adding quality, adjusting the infrastructure, and organizing and managing resources. Capacity building will result in well-managed collections with increased expertise thereby expanding the national biodiversity knowledge base; and data acquisition and management capacity. This will in turn ensure continuous uploading and updating of information into the SIBBr</p>	

Outcome	Baseline	Alternative	Increment
	general lack of human capacity in the taxonomy of many groups creating barriers to the processing of new biodiversity information.		
	Cost: US\$100,672,215	Cost: US\$106,443,215	GEF: US\$0 Co-financing: US\$5,771,000 Total: US\$5,771,000
<i>Outcome 3:</i> Enabling framework to manage, distribute and use qualified information at federal and state level decision making for conservation of globally significant biodiversity.	Efforts to integrate biodiversity information into governmental planning at the federal level have been weakened by the high cost-benefit ratio of access to information. Due to the lack of mechanisms to integrate and provide access to biodiversity and environmental information that is produced in the country, decision-makers have had to resort to ad-hoc meetings of specialists, turning information appropriation into a long and expensive process. Current experience in integration of information and decision-making are few and restricted to thematic and/or geographic areas. The Secretariat of Environment of Sao Paulo has given initial steps by using Biota/Fapesp maps that identify conservation units and areas for restoration, which have been the basis for issuance of new regulations for environmental licensing in the mining sector of the State of Sao Paulo	Greater understanding and better decision-making processes applied to biodiversity conservation, management and use through: (i) products and services to meet the requirements of society and national decision-making processes, and (ii) improved collaboration and cooperation among institutions dealing with biodiversity management and use. This enhanced framework will allow adequate mainstreaming of biodiversity information about globally important topics and issues associated with the natural environment (such as land-use planning and ecosystem management, sustainable use of natural resources, control of invasive pest species, the trade in endangered species, and the emergence of new epidemiologies) into both national and international processes. Development and implementation of a national level biodiversity information system will provide elements that can be adopted by other nations (especially large biodiverse countries in the developing world) seeking to gain similar benefits.	
	Cost: US\$2,600,000	Cost: US\$10,098,114	GEF: US\$3,706,828 Co-financing: US\$3,791,286 Total: US\$7,498,114
Project Management	Not Applicable	Cost: US\$1,971,714	GEF: US\$732,000 Co-financing: US\$1,239,714 Total: US\$1,971,714
	Cost: US\$342,037,957	Cost: US\$370,210,685	GEF: US\$8,172,728 Co-financing: US\$20,000,000 Total: US\$28,172,728

Appendix 4: Results Framework

Intervention Logic					
Project Goal: To contribute to the conservation of Brazil's globally significant biodiversity					
Outcomes and Outputs	Objectively Verifiable Indicators			Sources of verification	Critical Assumptions/Risks
	Indicators	Baseline	Target		
<p>Project Objective: To ensure data-driven policy design and implementation by facilitating and mainstreaming biodiversity information into decision-making and policy development processes.</p>	<p>Brazil's reports to the CBD and other international biodiversity and environmental institutions incorporate SIBBr information</p> <p>Number of new policies and/or legal instruments at federal and state level and protected areas management plans incorporating or making use of qualified information produced by the SIBBr</p> <p>Number of Ministries using/and or citing SIBBr resources or information in biodiversity and environmental policy/programme design and implementation</p>	<p>No historical series</p> <p>Non-existent</p> <p>Non-existent</p>	<p>By PY3 and beyond Brazil's reports to the CBD and other reports incorporate information based on the SIBBr</p> <p>By PY5 at least 2 new policy/legal instruments and 10 management plans with the overall process being enhanced</p> <p>By PY4 the MMA and MCT and by PY5 at least 3 additional Ministries/institutions</p>	<p>Reports to the CBD</p> <p>Reports by international institutions</p> <p>Reports by national public institutions and CSOs</p> <p>Mid-term evaluation report</p> <p>Terminal evaluation report</p>	<p>Brazilian biodiversity is relevant in the international context and, as such, the streamlining of qualified information has global significance.</p> <p>Value-added biodiversity data quality and availability are fundamental enablers for improved and qualified decision-making processes in governmental, state and institutional spheres.</p>
<p>Outcome 1: The information contained in Brazilian biological centers and networks has been organized, qualified and integrated into the Brazilian Biodiversity Information System - SIBBr.</p>	<p>Number of data providers (institutions, biological networks, information systems) effectively integrated to the SIBBr.</p>	<p>Several existing information systems in different institutions; over 200 collections, etc. Strong</p>	<p>The SIBBr is operational by PY2 with at least 50% of key identified data providers integrated by PY3, 60% by PY4 and</p>	<p>Agreements and MoUs integrating data providers to the SIBBr</p> <p>SIBBr technical documents and management reports</p>	<p>An information system integrating a significant number of diverse biodiversity-related institutions and databases at various organizational levels brings qualified</p>

Intervention Logic					
Project Goal: To contribute to the conservation of Brazil's globally significant biodiversity					
Outcomes and Outputs	Objectively Verifiable Indicators			Sources of verification	Critical Assumptions/Risks
	Indicators	Baseline	Target		
	Percentage of increase in data contents of the SIBBr	communications network. (see Appendix 17 for further details) (see Table 1 end of LF)	70% by PY5 BY PY5 data content increases in accordance with percentages included in Table 1 (end of LF)	Reports from SIBBr member institutions (public sector, CSOs, Universities, other) and international institutions MCT Annual Reports Reports/records from international initiatives (GBIF, CoL, others) Project M&E reports	biodiversity data availability into reality to institutions and users. Strengthened inter-institutional collaboration Increased visibility and greater data quality incentivate data providers to participate and share information
Outputs for Outcome 1: 1.1 Stakeholder and political articulation 1.2 Communication infrastructure expanded and consolidated 1.3 Increased content and usability of primary species occurrence data 1.4 Biodiversity data digitized 1.5 National repository for observational data developed 1.6 Dynamic catalogue for species found in Brazil developed 1.7 Quality added to biodiversity data.					
Outcome 2: Institutional and taxonomic capacities are strengthened to ensure continuous uploading and updating of information into the SIBBr	Number of governmental programmes that receive capacity building support and have increased their capacities in taxonomy, policy development and research Number of biological collections that have been	MCT and MMA have ongoing taxonomy programmes Some 20 collections have been identified	By PY3 at least 1 programme and by PY5 at least 1 additional programme strengthened By PY5 at least 50% of identified	SIBBr management reports Ministries and governmental agencies reports Project M&E reports	SIBB is an enabler, as information system integrator, for biodiversity capacity creation, research and policy development support at national and international levels. Strengthened inter-institutional collaboration

Intervention Logic					
Project Goal: To contribute to the conservation of Brazil’s globally significant biodiversity					
Outcomes and Outputs	Objectively Verifiable Indicators			Sources of verification	Critical Assumptions/Risks
	Indicators	Baseline	Target		
	Number of downloaded tools and/or “service utilization” increase on an annual basis	Tools and services provided by existing national information systems do not target decision makers	Annual increase of at least 10% (baseline to be determined by end of PY3 when decision making tools will become available		increased use in decision making
Outputs for Outcome 3: 3.1 End-user demands identified and weaknesses regarding products (institutional, software, etc.) assessed 3.2 Core database and framework for application development implemented 3.3 Service environments and applications to map and model biodiversity developed 3.4 Products and services that meet the identified requirements for decision-makers developed 3.5 Dissemination strategy targeted at potential users in the private, non-governmental and governmental sectors at federal, state and local levels 3.6 Capacity of end-users to use the information system strengthened 3.7 A system of governance for the information system developed					

Appendix 4.1: Estimated increase in data contents of SIBBr (outcome 1)

Topic	Baseline (online records)	Target (5 years)
Botanical specimen data	1,932,276	3 million
Botanical specimen data - repatriation	419,155	800,000
List of plant species	Not available	Working list in place
Fish specimen data	219.964	300,000
Fresh water fish catalogue of names	Pdf file	Working list in place
Bird specimen data	36,947	100,000
List of birds of Brazil	Online <i>stand alone</i> list	List integrated to the data system
Amphibian and Reptile specimen data	158.272	300,000
Amphibian and Reptile list of names	Html file	List integrated to the data system
Mammal specimen data	32,000	100,000
List of Brazilian Mammals	World list and Wikipedia	List integrated to the data system
Arachnid specimen data	42,457	100,000
List of Arachnids of Brazil	scattered	Working lists online
Insect specimen data	363.634	700,000
List of Insect names	scattered	Working lists of specific groups online
Other invertebrate specimen data	32,943	100,000
List of other invertebrates names	scattered	Working lists of specific groups online
Catalogue of microbial strains	8,974	16,000
Accepted Bacterial Names	Online at DSMZ	Integrated to the network
Observation Data	234,006	1,000,000

Appendix 5: Workplan and timetable

Outcomes	Outputs	PY1		PY2		PY3		PY4		PY5	
		S1	S2	S3	S4	S5	S6	S7	S8	S9	S10
<i>Outcome 1: The information contained in Brazilian biological centers and networks has been organized, qualified and integrated into the Brazilian Biodiversity Information System (SIBBr).</i>	1.1 Stakeholder and Political articulation										
	1.2 Communication infrastructure expanded and consolidated										
	1.3 Increased content and usability of primary species occurrence data										
	1.4 Biodiversity data digitized										
	1.5 National repository for observational data developed										
	1.6 Dynamic catalogue for species found in Brazil implemented										
	1.7 Quality added to biodiversity data										
<i>Outcome 2: Institutional and taxonomic capacities have been strengthened to ensure continuous uploading and updating of information into the SIBBr.</i>	2.1 The Strategic Plan to strengthen taxonomic capacity and consolidate Brazilian biological collections reviewed and updated										
	2.2 Training of staff working in taxonomy and related fields										
	2.3 Biological collection infrastructure and research support improved										
	2.4 Targeted incentives to increase taxonomic and biogeographic knowledge										
<i>Outcome 3: Enabling framework to manage, distribute and use qualified information at federal and state level decision making for conservation of globally significant biodiversity.</i>	3.1 End-user demands identified and weaknesses regarding products (institutional, software, etc.) assessed										
	3.2 Core database and framework for application development implemented										
	3.3 Service environments and applications to map and model biodiversity developed										
	3.4 Products and services that meet the identified requirements for decision-makers developed										
	3.5 A dissemination strategy targeted at potential users in the private, non-governmental and governmental sectors at federal, state and local levels										
	3.6 Capacities of end-users strengthened to use the information system										
	3.7 A system of governance for the information system developed										

Appendix 6: Key deliverables and benchmarks

Outcomes/Outputs	Key Deliverables	Benchmarks
Outcome 1: <i>The information contained in Brazilian biological centers and networks has been organized, qualified and integrated into the Brazilian Biodiversity Information System (SIBBr)</i>		
<i>Output 1.1 Stakeholder and political articulation</i>	<ul style="list-style-type: none"> • Minutes of meetings • Institutional visit reports • SIBBr introductory materials • Formal agreements and MOUs between stakeholders • Legal framework for long term support for SIBBr 	<ul style="list-style-type: none"> • 1 inception workshop – M1/Y1 • 5 meetings/seminars with stakeholders – M4/8 – Y1, M1 – Y2, M1 – Y3, M1 – Y4 • 48 institutional visits – Y1 – Y5 • Production of SIBBr introductory materials – M3 – Y1, M1 – Y3 • Production of legal framework – Y1 – Y5
<i>Output 1.2 Communication infrastructure expanded and consolidated</i>	<ul style="list-style-type: none"> • SAN Server storage • TORs • Contracts • Expanded RNP • Contractor reports 	<ul style="list-style-type: none"> • Purchase SAN server storage – M8 – Y1 • Server installation and maintenance Y1– Y8 • Recruitment of hardware contractor Y1 • Expansion and maintenance of RNP Y1– Y8
<i>Output 1.3 Increased content and usability of primary species occurrence data</i>	<ul style="list-style-type: none"> • TORs • Contracts • Servers • Contractor reports • Repatriation of data records and reports 	<ul style="list-style-type: none"> • Productions of TORs/Contracts – M3/Y1 • Recruitment of contractor for integrating data into SIBBr – M6/Y1 • Recruitment of contractor for maintenance and development of SIBBr – M6/Y1 • Recruitment of contractor for data repatriation – M6/Y1 • Purchase and install servers – M6/Y1, M6/Y3
<i>Output 1.4 Biodiversity data digitized</i>	<ul style="list-style-type: none"> • Computers • TORs • Contracts • Contractor reports • Type specimens digitized 	<ul style="list-style-type: none"> • Computers purchased – M6/Y1– M6/Y2– M6/Y3– M6/Y4– M6/Y5 • Recruitment for digitization – M6/Y1– M6/Y2– M6/Y3– M6/Y4– M6/Y5
<i>Output 1.5 National repository for observational data developed</i>	<ul style="list-style-type: none"> • TORs • Contracts • Servers • Computers • Contractor reports • National repository 	<ul style="list-style-type: none"> • Purchase computers – M6/Y2 • Purchase servers – M6/Y2 • Recruitment of contractor to develop repository – M1/Y2
<i>Output 1.6 Dynamic catalogue for species found in Brazil implemented</i>	<ul style="list-style-type: none"> • Brazilian Catalogue of Life • TORs • Contracts • Contractor reports 	<ul style="list-style-type: none"> • Recruitment of contractor– M6/Y1 • Production of Brazilian Catalogue of Life – M6/Y5
<i>Output 1.7 Quality added to biodiversity data</i>	<ul style="list-style-type: none"> • Training workshops reports • Training materials 	<ul style="list-style-type: none"> • 5 Training workshops – M10/Y1– M10/Y2 – M10/Y3 – M10/Y4– M10/Y5 • Production of training materials – M9/Y1
Outcome 2: <i>Institutional and taxonomic capacities have been strengthened to ensure continuous uploading and updating of information into the SIBBr</i>		

Outcomes/Outputs	Key Deliverables	Benchmarks
<i>Output 2.1 The Strategic Plan to strengthen taxonomic capacity and consolidate Brazilian biological collections reviewed and updated</i>	<ul style="list-style-type: none"> • TORs • Contracts • Strategic plan • Contractor reports 	<ul style="list-style-type: none"> • Recruitment of contractor – M6/Y1 • Production of Strategic Plan – M10/Y1
<i>Output 2.2 Training of staff working in taxonomy and related fields</i>	<ul style="list-style-type: none"> • Taxonomic programme • Training courses programmes • Training course reports • Exchange programmes • Exchange programme reports • Promotional and communication material • Technical visits records 	<ul style="list-style-type: none"> • Development of taxonomic programme – Y1 – Y5 • 8 Training courses – Y1 – Y5 • 7 Exchange programmes – Y1 – Y5 • 10 Technical visits – Y1 – Y5 • 500 travel grants – Y1 – Y5
<i>Output 2.3 Biological collection infrastructure and research support improved</i>	<ul style="list-style-type: none"> • Call for infrastructure, maintenance, modernization and management 	<ul style="list-style-type: none"> • Production of call – M10/Y1
<i>Output 2.4 Targeted incentives to increase taxonomic and biogeographic knowledge</i>	<ul style="list-style-type: none"> • TORs • Contracts • Call for targeted support to increase taxonomic and biogeographic knowledge • Contractor reports 	<ul style="list-style-type: none"> • Recruitment of contractor to analyse taxonomic and biogeographic gaps – M5/Y2 • Production of call –M10/Y2
Outcome 3: Enabling framework to manage, distribute and use qualified information at federal and state level decision making for conservation of globally significant biodiversity		
<i>Output 3.1 End-user demands identified and weaknesses regarding products (institutional, software, etc.) assessed</i>	<ul style="list-style-type: none"> • TORs • Contracts • Seminars reports • Promotional and communication material • Contractor reports • List of desirable applications – technical documents 	<ul style="list-style-type: none"> • Recruitment of contractor to identify stakeholder demands – M1/Y3, –M1/Y5 • Recruitment of contractor to assess weaknesses of products – M10/Y3 • 10 seminars/workshops – M1/4/6/9 – Y3, M1/5/9 – Y4, M1/5/9 Y5 • Production and dissemination of promotional material – M10/Y1
<i>Output 3.2 Core database and framework for application development implemented</i>	<ul style="list-style-type: none"> • TORs • Contracts • Core servers • Contractor reports • Protocols • Nationwide data network – technical documents 	<ul style="list-style-type: none"> • Recruitment of contractor to develop SIBBr core –M8/Y1 • Recruitment of contractor to develop core architecture – M8/Y1 • Purchase and installation of core server –M10/Y1
<i>Output 3.3 Service environments and applications to map and model biodiversity developed</i>	<ul style="list-style-type: none"> • TOR • Contract • Contractor reports • Maps of species distribution data 	<ul style="list-style-type: none"> • Recruitment of contractor to develop applications –M6/Y3
<i>Output 3.4 Products and services that meet the identified requirements for decision-makers developed</i>	<ul style="list-style-type: none"> • TORs • Contracts • Contractor reports • Dynamic red list system application • Biodiversity inventory system application • Early warning system 	<ul style="list-style-type: none"> • Recruitment of 4 contractors to develop applications –M6/Y2 – M6/Y3 –M6/Y4 –M1/Y5 • Recruitment of 6 contractors to develop new applications – M6/Y3 –M6/Y4 –M1/Y5

Outcomes/Outputs	Key Deliverables	Benchmarks
	application <ul style="list-style-type: none"> • Biodiversity “business intelligence” tool • 6 new applications 	
<i>Output 3.5 A dissemination strategy targeted at potential users in the private, non-governmental and governmental sectors at federal, state and local levels</i>	<ul style="list-style-type: none"> • Communication materials • Seminars reports • Meetings/workshops reports • TOR • Contract • National visits reports • Contractor reports 	<ul style="list-style-type: none"> • Recruitment of contractor to develop communication materials –M6/Y1 • Production of promotional and communication materials – M6/Y2 • 2 Seminars in each State (27) Y1 to Y5 • 5 meetings/workshops in Brasilia –M6/Y1 –M6/Y2 – M6/Y3 –M6/Y4 –M6/Y5
<i>Output 3.6 Capacities of end-users strengthened to use the information system</i>	<ul style="list-style-type: none"> • State Training courses reports • National training courses reports • Training materials • Equipment for end-users 	<ul style="list-style-type: none"> • 2 Training courses in each state (27) Y2–Y5 • 10 national training courses (Brasilia) –M3/Y3 –M6/Y3 – M9/Y3 –M12/Y3 –M4/Y4 – M7/Y4 –M11/Y4 –M4/Y5 – M7/Y5 –M11/Y5 • Production of training materials –M6/Y2 • Purchase of equipment for end-users – M8/Y3
<i>Output 3.7 A system of governance for the information system developed</i>	<ul style="list-style-type: none"> • Governance seminar reports • Sustainability seminars reports • TORs • Contracts • Contractor reports • SIBBr governance structure documents 	<ul style="list-style-type: none"> • 3 seminars on governance – M5/8 –Y1, M6 –Y2 • 3 seminars on financial sustainability M6 –Y2, M6– Y3, M6 – Y4 • Recruitment of contractor to develop governance M3 –Y1 • Recruitment of contractor to develop financial sustainability M3– Y2

Appendix 7: Costed M&E plan

1. M&E plan

Objective / Outcome	Outcome / objective level indicator	Baseline Conditions	Mid point Target (as relevant)	End of Project Target	Means of Verification	Monitoring / sampling (frequency / size)	Location / Group	Responsibility	Time frame	Budget (Object of expenditure & cost)
Project Objective: To ensure data-driven policy design and implementation by facilitating and mainstreaming biodiversity information into decision-making and policy development processes.	Brazil's reports to the CBD and other international biodiversity and environmental institutions incorporate SIBBr information	No historical series	By PY3 and beyond Brazil's reports to the CBD and other reports incorporate information based on the SIBBr	By PY3 and beyond Brazil's reports to the CBD and other reports incorporate information based on the SIBBr	Reports to the CBD Reports by international institutions Reports by national public institutions and CSOs	Yearly	National/International level	PMU (M&E specialist) – External Evaluators	PY1-PY5	PMU costs include salaries and travel costs of an M&E specialist in charge of M&E
	Number of new policies and/or legal instruments at federal and state level and protected areas management plans incorporating or making use of qualified information produced by the SIBBr	Non-existent	By PY5 at least 2 new policy/legal instruments and 10 management plans with the overall process being enhanced	Mid-term evaluation report Terminal evaluation report						
	Number of Ministries using/and or citing SIBBr resources or information in	Non-existent	By PY4 the MMA and MCT	PY5 at least 3 additional Ministries/institutions						

Objective / Outcome	Outcome / objective level indicator	Baseline Conditions	Mid point Target (as relevant)	End of Project Target	Means of Verification	Monitoring / sampling (frequency / size)	Location / Group	Responsibility	Time frame	Budget (Object of expenditure & cost)
	biodiversity and environmental policy/programme design and implementation									
Outcome 1: The information contained in Brazilian biological centers and networks has been organized, qualified and integrated into the Brazilian Biodiversity Information System - SIBBr.	Number of data providers (institutions, biological networks, information systems) effectively integrated to the SIBBr. Percentage of increase in data contents of the SIBBr	Several existing information systems in different institutions; over 200 collections, etc. Strong communications network. (see Appendix 17 for further details) (see Table 1 end of LF)	The SIBBr is operational by PY2 with at least 50% of key identified data providers integrated by PY3 and 60% by PY4	By PY5 70% of data providers integrated BY PY5 data content increases in accordance with percentages included in Table 1 (end of LF)	Agreements and MoUs SIBBr technical documents and management reports Reports from SIBBr member institutions (public sector, CSOs, Universities, other) and international institutions MCT Annual Reports Reports/records from international initiatives (GBIF, CoL, others)	Yearly	National level	PMU (M&E specialist) – External Evaluators	PY1-PY5	PMU costs include salaries and travel costs of an M&E specialist in charge of M&E

Objective / Outcome	Outcome / objective level indicator	Baseline Conditions	Mid point Target (as relevant)	End of Project Target	Means of Verification	Monitoring / sampling (frequency / size)	Location / Group	Responsibility	Time frame	Budget (Object of expenditure & cost)
					Project M&E reports					
Outcome 2: Institutional and taxonomic capacities are strengthened to ensure continuous uploading and updating of information into the SIBBr	Number of governmental programmes that receive capacity building support and have increased their capacities in taxonomy, policy development and research Number of biological collections that have been modernized and consolidated for improved participation in the SIBBr	MCT and MMA have ongoing taxonomy programmes Some 20 collections have been identified as needing strengthening	By PY3 at least 1 programme	By PY5 at least 1 additional programme By PY5 at least 50% of identified collections have improved their physical structure and management capacities	SIBBr management reports Ministries and governmental agencies reports Project M&E reports	Yearly	National level	PMU (M&E specialist) – External Evaluators	PY1-PY5	PMU costs include salaries and travel costs of an M&E specialist in charge of M&E
Outcome 3: Enabling framework to manage, distribute and use qualified information at federal, state,	Number of new services and/or decision-making tools tailored to meet the	Several tools and services available (<i>speciesLINK</i> , SinBiota, etc) but with limited	By PY3 at least 5 new management services and/or decision making		SIBBr management reports SIBBr Information System and	Yearly	National level	PMU (M&E specialist) – External Evaluators	PY1-PY5	PMU costs include salaries and travel costs of an M&E specialist in charge of

Objective / Outcome	Outcome / objective level indicator	Baseline Conditions	Mid point Target (as relevant)	End of Project Target	Means of Verification	Monitoring / sampling (frequency / size)	Location / Group	Responsibility	Time frame	Budget (Object of expenditure & cost)
and local level decision making for conservation of globally significant biodiversity.	demands of federal, state and local level decision makers and being used by them Number of key decision making institutions effectively linked with functional interfaces to the SIBBr and generating reports Number of downloaded tools and/or “service utilization” increase on an annual basis	geographical scope and not targeting decision-makers Non-existent Tools and services provided by existing national information systems do not target decision makers	tools: By PY4 the MMA Annual increase of at least 10% (baseline to be determined by end of PY3 when decision making tools will become available	 PY5 at least 3 additional Ministries/Institutions Annual increase of at least 10% (baseline to be determined by end of PY3 when decision making tools will become available	Management statistics SIBBr webpage statistics Reports by biodiversity and environmental institutions and collections Project M&E reports					M&E

2. Cost of acquisition of essential baseline data during first year of project: --

3. Cost of project inception workshop (please include proposed location, number of participants):

- Estimated cost of project inception workshop: US\$50,000
- Proposed location: Brasilia

- Number of participants: 20-30 (MCT/PMU, UNEP and key stakeholders)
- 4. Cost of Mid-Term Review/Evaluation: US\$50,000 (external consultant(s))
- 5. Cost of Terminal Evaluation: US\$50,000 (external consultant(s))
- 6. Any additional M&E costs: (a) Publications (lessons learnt, technical documents and reports US\$50,000), (b) Steering Committee Meetings: US\$25,000 (c) Annual external audits: US\$15,000

Appendix 8: Summary of reporting requirements and responsibilities

Appendix 8 – Reporting requirements	Due date	Format appended to legal instrument as	Responsibility of
Procurement plan (goods and services)	2 weeks before project inception meeting	N/A	Project Manager
Inception Report	1 month after project inception meeting	N/A	Project Manager
Expenditure report accompanied by explanatory notes	Quarterly on or before 30 April, 31 July, 31 October, 31 January	Annex 11	Project Manager
Cash Advance request and details of anticipated disbursements	Quarterly or when required	Annex 7B	Project Manager
Progress report	Half-yearly on or before 31 January	Annex 8	Project Manager
Audited report for expenditures for year ending 31 December	Yearly on or before 30 June	N/A	Executing partner to contract firm
Inventory of non-expendable equipment	Yearly on or before 31 January	Annex 6	Project Manager
Co-financing report	Yearly on or before 31 July	Annex 12	Project Manager
Project implementation review (PIR) report	Yearly on or before 31 August	Annex 9	Project Manager, TM, DGEF FMO
Minutes of steering committee meetings	Yearly (or as relevant)	N/A	Project Manager
Mission reports and “aide memoire” for executing agency	Within 2 weeks of return	N/A	TM, DGEF FMO
Final report	2 months of project completion date	Annex 10	Project Manager
Final inventory of non-expendable equipment		Annex 9	Project Manager
Equipment transfer letter		Annex 10	Project Manager
Final expenditure statement	3 months of project completion date	Annex 11	Project Manager
Mid-term review or Mid-term evaluation	Midway though project	N/A	TM or EOU (as relevant)
Final audited report for expenditures of project	6 months of project completion date	N/A	Executing partner to contract firm
Independent terminal evaluation report	6 months of project completion date	Appendix 9 to Annex 1	EOU

Appendix 9: Standard Terminal Evaluation TOR

Terminal Evaluation of the UNEP GEF project {Title}

1. PROJECT BACKGROUND AND OVERVIEW

Project rationale

The objective was stated as:

The indicators given in the project document for this stated objective were:

Relevance to GEF Programmes

The project is in line with:

Executing Arrangements

The implementing agency(ies) for this project was (were) UNEP and { }; and the executing agencies were:

The lead national agencies in the focal countries were:

Project Activities

The project comprised activities grouped in {number} components.

Budget

At project inception the following budget prepared:

	<u>GEF</u>	<u>Co-funding</u>
Project preparation funds:		
GEF {Medium/Full} Size Grant		

TOTAL (including project preparation funds)

Co-funding sources:

Anticipated:

APPENDIX 9 TERMS OF REFERENCE FOR THE EVALUATION

1. Objective and Scope of the Evaluation

The objective of this terminal evaluation is to examine the extent and magnitude of any project impacts to date and determine the likelihood of future impacts. The evaluation will also assess project performance and the implementation of planned project activities and planned outputs against actual results. The evaluation will focus on the following main questions:

1. Did the project help to {} among key target audiences (international conventions and initiatives, national level policy-makers, regional and local policy-makers, resource managers and practitioners).
2. Did the outputs of the project articulate options and recommendations for {}? Were these options and recommendations used? If so by whom?
3. To what extent did the project outputs produced have the weight of scientific authority and credibility necessary to influence policy makers and other key audiences?

Methods

This terminal evaluation will be conducted as an in-depth evaluation using a participatory approach whereby the UNEP/DGEF Task Manager, key representatives of the executing agencies and other relevant staff are kept informed and consulted throughout the evaluation. The consultant will liaise with the UNEP/EOU and the UNEP/DGEF Task Manager on any logistic and/or methodological issues to properly conduct the review in as independent a way as possible, given the circumstances and resources offered. The draft report will be circulated to UNEP/DGEF Task Manager, key representatives of the executing agencies and the UNEP/EOU. Any comments or responses to the draft report will be sent to UNEP / EOU for collation and the consultant will be advised of any necessary or suggested revisions.

The findings of the evaluation will be based on the following:

1. A desk review of project documents including, but not limited to:
 - (a) The project documents, outputs, monitoring reports (such as progress and financial reports to UNEP and GEF annual Project Implementation Review reports) and relevant correspondence.
 - (b) Notes from the Steering Group meetings.
 - (c) Other project-related material produced by the project staff or partners.
 - (d) Relevant material published on the project web-site: {}.
2. Interviews with project management and technical support including {NEED INPUT FROM TM HERE}
3. Interviews and Telephone interviews with intended users for the project outputs and other stakeholders involved with this project, including in the participating countries and international bodies. The Consultant shall determine whether to seek additional information and opinions from representatives of donor agencies and other organizations. As appropriate, these interviews could be combined with an email questionnaire.
4. Interviews with the UNEP/DGEF project task manager and Fund Management Officer, and other relevant staff in UNEP dealing with {relevant GEF focal area(s)}-related activities as necessary. The Consultant shall also gain broader perspectives from discussions with relevant GEF Secretariat staff.
5. Field visits⁵⁰ to project staff

⁵⁰ Evaluators should make a brief courtesy call to GEF Country Focal points during field visits if at all possible.

Key Evaluation principles.

In attempting to evaluate any outcomes and impacts that the project may have achieved, evaluators should remember that the project's performance should be assessed by considering the difference between the answers to two simple questions “*what happened?*” and “*what would have happened anyway?*”. These questions imply that there should be consideration of the baseline conditions and trends in relation to the intended project outcomes and impacts. In addition it implies that there should be plausible evidence to **attribute** such outcomes and impacts **to the actions of the project**.

Sometimes, adequate information on baseline conditions and trends is lacking. In such cases this should be clearly highlighted by the evaluator, along with any simplifying assumptions that were taken to enable the evaluator to make informed judgements about project performance.

2. Project Ratings

The success of project implementation will be rated on a scale from ‘highly unsatisfactory’ to ‘highly satisfactory’. In particular the evaluation shall **assess and rate** the project with respect to the eleven categories defined below:⁵¹

A. Attainment of objectives and planned results:

The evaluation should assess the extent to which the project's major relevant objectives were effectively and efficiently achieved or are expected to be achieved and their relevance.

- *Effectiveness*: Evaluate how, and to what extent, the stated project objectives have been met, taking into account the “achievement indicators”. The analysis of outcomes achieved should include, *inter alia*, an assessment of the extent to which the project has directly or indirectly assisted policy and decision-makers to apply information supplied by biodiversity indicators in their national planning and decision-making. In particular:
 - Evaluate the immediate impact of the project on {relevant focal area} monitoring and in national planning and decision-making and international understanding and use of biodiversity indicators.
 - As far as possible, also assess the potential longer-term impacts considering that the evaluation is taking place upon completion of the project and that longer term impact is expected to be seen in a few years time. Frame recommendations to enhance future project impact in this context. Which will be the major ‘channels’ for longer term impact from the project at the national and international scales?
 - *Relevance*: In retrospect, were the project’s outcomes consistent with the focal areas/operational program strategies? Ascertain the nature and significance of the contribution of the project outcomes to the {relevant Convention(s)} and the wider portfolio of the GEF.
 - *Efficiency*: Was the project cost effective? Was the project the least cost option? Was the project implementation delayed and if it was, then did that affect cost-effectiveness? Assess the contribution of cash and in-kind co-financing to project implementation and to what extent the project leveraged additional resources. Did the project build on earlier initiatives, did it make effective use of available scientific and / or technical information. Wherever possible, the evaluator should also compare the cost-time vs. outcomes relationship of the project with that of other similar projects.

B. Sustainability:

Sustainability is understood as the probability of continued long-term project-derived outcomes and impacts after the GEF project funding ends. The evaluation will identify and assess the key conditions or factors that are likely to contribute or undermine the persistence of benefits after the project ends. Some of these factors might be outcomes of the project, e.g. stronger institutional capacities or better informed decision-making. Other factors will include contextual circumstances or developments that are not outcomes of the project but that are relevant to the sustainability of

⁵¹ However, the views and comments expressed by the evaluator need not be restricted to these items.

outcomes. The evaluation should ascertain to what extent follow-up work has been initiated and how project outcomes will be sustained and enhanced over time.

Five aspects of sustainability should be addressed: financial, socio-political, institutional frameworks and governance, environmental (if applicable). The following questions provide guidance on the assessment of these aspects:

- *Financial resources.* Are there any financial risks that may jeopardize sustenance of project outcomes? What is the likelihood that financial and economic resources will not be available once the GEF assistance ends (resources can be from multiple sources, such as the public and private sectors, income generating activities, and trends that may indicate that it is likely that in future there will be adequate financial resources for sustaining project's outcomes)? To what extent are the outcomes of the project dependent on continued financial support?
- *Socio-political:* Are there any social or political risks that may jeopardize sustenance of project outcomes? What is the risk that the level of stakeholder ownership will be insufficient to allow for the project outcomes to be sustained? Do the various key stakeholders see that it is in their interest that the project benefits continue to flow? Is there sufficient public / stakeholder awareness in support of the long term objectives of the project?
- *Institutional framework and governance.* To what extent is the sustenance of the outcomes of the project dependent on issues relating to institutional frameworks and governance? What is the likelihood that institutional and technical achievements, legal frameworks, policies and governance structures and processes will allow for, the project outcomes/benefits to be sustained? While responding to these questions consider if the required systems for accountability and transparency and the required technical know-how are in place.
- *Environmental.* Are there any environmental risks that can undermine the future flow of project environmental benefits? The TE should assess whether certain activities in the project area will pose a threat to the sustainability of the project outcomes. For example; construction of dam in a protected area could inundate a sizable area and thereby neutralize the biodiversity-related gains made by the project; or, a newly established pulp mill might jeopardise the viability of nearby protected forest areas by increasing logging pressures; or a vector control intervention may be made less effective by changes in climate and consequent alterations to the incidence and distribution of malarial mosquitoes.

C. Achievement of outputs and activities:

- Delivered outputs: Assessment of the project's success in producing each of the programmed outputs, both in quantity and quality as well as usefulness and timeliness.
- Assess the soundness and effectiveness of the methodologies used for developing the technical documents and related management options in the participating countries
- Assess to what extent the project outputs produced have the weight of scientific authority / credibility, necessary to influence policy and decision-makers, particularly at the national level.

D. Catalytic Role

Replication and catalysis. What examples are there of replication and catalytic outcomes? Replication approach, in the context of GEF projects, is defined as lessons and experiences coming out of the project that are replicated or scaled up in the design and implementation of other projects. Replication can have two aspects, replication proper (lessons and experiences are replicated in different geographic area) or scaling up (lessons and experiences are replicated within the same geographic area but funded by other sources). Specifically:

- Do the recommendations for management of {project} coming from the country studies have the potential for application in other countries and locations?

If no effects are identified, the evaluation will describe the catalytic or replication actions that the project carried out.

E. Assessment monitoring and evaluation systems.

The evaluation shall include an assessment of the quality, application and effectiveness of project monitoring and evaluation plans and tools, including an assessment of risk management based on the assumptions and risks identified in the project document. The Terminal Evaluation will assess whether the project met the minimum requirements for ‘project design of M&E’ and ‘the application of the Project M&E plan’ (see minimum requirements 1&2 in *Annex 4* to this Appendix). GEF projects must budget adequately for execution of the M&E plan, and provide adequate resources during implementation of the M&E plan. Project managers are also expected to use the information generated by the M&E system during project implementation to adapt and improve the project.

M&E during project implementation

- *M&E design.* Projects should have sound M&E plans to monitor results and track progress towards achieving project objectives. An M&E plan should include a baseline (including data, methodology, etc.), SMART indicators (see Annex 4) and data analysis systems, and evaluation studies at specific times to assess results. The time frame for various M&E activities and standards for outputs should have been specified.
- *M&E plan implementation.* A Terminal Evaluation should verify that: an M&E system was in place and facilitated timely tracking of results and progress towards projects objectives throughout the project implementation period (perhaps through use of a logframe or similar); annual project reports and Progress Implementation Review (PIR) reports were complete, accurate and with well justified ratings; that the information provided by the M&E system was used during the project to improve project performance and to adapt to changing needs; and that projects had an M&E system in place with proper training for parties responsible for M&E activities.
- *Budgeting and Funding for M&E activities.* The terminal evaluation should determine whether support for M&E was budgeted adequately and was funded in a timely fashion during implementation.

F. Preparation and Readiness

Were the project’s objectives and components clear, practicable and feasible within its timeframe? Were the capacities of executing institution and counterparts properly considered when the project was designed? Were lessons from other relevant projects properly incorporated in the project design? Were the partnership arrangements properly identified and the roles and responsibilities negotiated prior to project implementation? Were counterpart resources (funding, staff, and facilities), enabling legislation, and adequate project management arrangements in place?

G. Country ownership / drivenness:

This is the relevance of the project to national development and environmental agendas, recipient country commitment, and regional and international agreements. The evaluation will:

- Assess the level of country ownership. Specifically, the evaluator should assess whether the project was effective in providing and communicating biodiversity information that catalyzed action in participating countries to improve decisions relating to the conservation and management of the focal ecosystem in each country.
- Assess the level of country commitment to the generation and use of biodiversity indicators for decision-making during and after the project, including in regional and international fora.

H. Stakeholder participation / public awareness:

This consists of three related and often overlapping processes: information dissemination, consultation, and “stakeholder” participation. Stakeholders are the individuals, groups,

institutions, or other bodies that have an interest or stake in the outcome of the GEF- financed project. The term also applies to those potentially adversely affected by a project. The evaluation will specifically:

- Assess the mechanisms put in place by the project for identification and engagement of stakeholders in each participating country and establish, in consultation with the stakeholders, whether this mechanism was successful, and identify its strengths and weaknesses.
- Assess the degree and effectiveness of collaboration/interactions between the various project partners and institutions during the course of implementation of the project.
- Assess the degree and effectiveness of any various public awareness activities that were undertaken during the course of implementation of the project.

I. Financial Planning

Evaluation of financial planning requires assessment of the quality and effectiveness of financial planning and control of financial resources throughout the project's lifetime. Evaluation includes actual project costs by activities compared to budget (variances), financial management (including disbursement issues), and co- financing. The evaluation should:

- Assess the strength and utility of financial controls, including reporting, and planning to allow the project management to make informed decisions regarding the budget and allow for a proper and timely flow of funds for the payment of satisfactory project deliverables.
- Present the major findings from the financial audit if one has been conducted.
- Identify and verify the sources of co- financing as well as leveraged and associated financing (in co-operation with the IA and EA).
- Assess whether the project has applied appropriate standards of due diligence in the management of funds and financial audits.
- The evaluation should also include a breakdown of final actual costs and co-financing for the project prepared in consultation with the relevant UNEP/DGEF Fund Management Officer of the project (table attached in *Annex 1* to this Appendix Co-financing and leveraged resources).

J. Implementation approach:

This includes an analysis of the project's management framework, adaptation to changing conditions (adaptive management), partnerships in implementation arrangements, changes in project design, and overall project management. The evaluation will:

- Ascertain to what extent the project implementation mechanisms outlined in the project document have been closely followed. In particular, assess the role of the various committees established and whether the project document was clear and realistic to enable effective and efficient implementation, whether the project was executed according to the plan and how well the management was able to adapt to changes during the life of the project to enable the implementation of the project.
- Evaluate the effectiveness and efficiency and adaptability of project management and the supervision of project activities / project execution arrangements at all levels (1) policy decisions: Steering Group; (2) day to day project management in each of the country executing agencies and {lead executing agency}.

K. UNEP Supervision and Backstopping

- Assess the effectiveness of supervision and administrative and financial support provided by UNEP/DGEF.
- Identify administrative, operational and/or technical problems and constraints that influenced the effective implementation of the project.

The *ratings will be presented in the form of a table*. Each of the eleven categories should be rated separately with **brief justifications** based on the findings of the main analysis. An overall rating for the project should also be given. The following rating system is to be applied:

HS = Highly Satisfactory

S	= Satisfactory
MS	= Moderately Satisfactory
MU	= Moderately Unsatisfactory
U	= Unsatisfactory
HU	= Highly Unsatisfactory

3. Evaluation report format and review procedures

The report should be brief, to the point and easy to understand. It must explain; the purpose of the evaluation, exactly what was evaluated and the methods used. The report must highlight any methodological limitations, identify key concerns and present evidence-based findings, consequent conclusions, recommendations and lessons. The report should be presented in a way that makes the information accessible and comprehensible and include an executive summary that encapsulates the essence of the information contained in the report to facilitate dissemination and distillation of lessons.

The evaluation will rate the overall implementation success of the project and provide individual ratings of the eleven implementation aspects as described in Section 1 of this TOR. The ratings will be presented in the format of a table with brief justifications based on the findings of the main analysis.

Evidence, findings, conclusions and recommendations should be presented in a complete and balanced manner. Any dissident views in response to evaluation findings will be appended in an annex. The evaluation report shall be written in English, be of no more than 50 pages (excluding annexes), use numbered paragraphs and include:

- i) An **executive summary** (no more than 3 pages) providing a brief overview of the main conclusions and recommendations of the evaluation;
- ii) **Introduction and background** giving a brief overview of the evaluated project, for example, the objective and status of activities; The GEF Monitoring and Evaluation Policy, 2006, requires that a TE report will provide summary information on when the evaluation took place; places visited; who was involved; the key questions; and, the methodology.
- iii) **Scope, objective and methods** presenting the evaluation's purpose, the evaluation criteria used and questions to be addressed;
- iv) **Project Performance and Impact** providing *factual evidence* relevant to the questions asked by the evaluator and interpretations of such evidence. This is the main substantive section of the report. The evaluator should provide a commentary and analysis on all eleven evaluation aspects (A – K above).
- v) **Conclusions and rating** of project implementation success giving the evaluator's concluding assessments and ratings of the project against given evaluation criteria and standards of performance. The conclusions should provide answers to questions about whether the project is considered good or bad, and whether the results are considered positive or negative. The ratings should be provided with a brief narrative comment in a table (see *Annex 1* to this Appendix);
- vi) **Lessons (to be) learned** presenting general conclusions from the standpoint of the design and implementation of the project, based on good practices and successes or problems and mistakes. Lessons should have the potential for wider application and use. All lessons should 'stand alone' and should:
 - Briefly describe the context from which they are derived
 - State or imply some prescriptive action;
 - Specify the contexts in which they may be applied (if possible, who when and where)
- vii) **Recommendations** suggesting *actionable* proposals for improvement of the current project. In general, Terminal Evaluations are likely to have very few (perhaps two or three) actionable recommendations.

Prior to each recommendation, the issue(s) or problem(s) to be addressed by the recommendation should be clearly stated.

A high quality recommendation is an actionable proposal that is:

1. Feasible to implement within the timeframe and resources available
2. Commensurate with the available capacities of project team and partners
3. Specific in terms of who would do what and when
4. Contains results-based language (i.e. a measurable performance target)
5. Includes a trade-off analysis, when its implementation may require utilizing significant resources that would otherwise be used for other project purposes.

viii) **Annexes** may include additional material deemed relevant by the evaluator but must include:

1. The Evaluation Terms of Reference,
2. A list of interviewees, and evaluation timeline
3. A list of documents reviewed / consulted
4. Summary co-finance information and a statement of project expenditure by activity
5. The expertise of the evaluation team. (brief CV).

TE reports will also include any response / comments from the project management team and/or the country focal point regarding the evaluation findings or conclusions as an annex to the report, however, such will be appended to the report by UNEP EOU.

Examples of UNEP GEF Terminal Evaluation Reports are available at www.unep.org/eou

Review of the Draft Evaluation Report

Draft reports submitted to UNEP EOU are shared with the corresponding Programme or Project Officer and his or her supervisor for initial review and consultation. The DGEF staff and senior Executing Agency staff are allowed to comment on the draft evaluation report. They may provide feedback on any errors of fact and may highlight the significance of such errors in any conclusions. The consultation also seeks feedback on the proposed recommendations. UNEP EOU collates all review comments and provides them to the evaluators for their consideration in preparing the final version of the report.

4. Submission of Final Terminal Evaluation Reports.

The final report shall be submitted in electronic form in MS Word format and should be sent to the following persons:

Segbedzi Norgbey, Chief,
UNEP Evaluation and Oversight Unit
P.O. Box 30552-00100
Nairobi, Kenya
Tel.: +(254-20)762-4181
Fax: +(254-20)762-3158
Email: Segbedzi.Norgbey@unep.org

With a copy to:

Maryam Niamir-Fuller,
Director
UNEP/Division of GEF Coordination
P.O. Box 30552-00100
Nairobi, Kenya
Tel: +(254-20)762-4166
Fax: +(254-20)762-4041/2
Email: Maryam.Niamir-Fuller@unep.org

{Name}
[Task Manager](#)

{Contact details}

The Final evaluation will also be copied to the following GEF National Focal Points.

{Insert contact details here}

The final evaluation report will be published on the Evaluation and Oversight Unit's web-site www.unep.org/eou and may be printed in hard copy. Subsequently, the report will be sent to the GEF Office of Evaluation for their review, appraisal and inclusion on the GEF website.

5. Resources and schedule of the evaluation

This final evaluation will be undertaken by an international evaluator contracted by the Evaluation and Oversight Unit, UNEP. The contract for the evaluator will begin on ddmmyyy and end on ddmmyyy (# days) spread over # weeks (# days of travel, to {country(ies)}, and # days desk study). The evaluator will submit a draft report on ddmmyyy to UNEP/EOU, the UNEP/DGEF Task Manager, and key representatives of the executing agencies. Any comments or responses to the draft report will be sent to UNEP / EOU for collation and the consultant will be advised of any necessary revisions. Comments to the final draft report will be sent to the consultant by ddmmyyy after which, the consultant will submit the final report no later than ddmmyyy.

The evaluator will after an initial telephone briefing with EOU and UNEP/GEF conduct initial desk review work and later travel to {country(ies)} and meet with project staff at the beginning of the evaluation. Furthermore, the evaluator is expected to travel to {country(ies)} and meet with representatives of the project executing agencies and the intended users of project's outputs.

In accordance with UNEP/GEF policy, all GEF projects are evaluated by independent evaluators contracted as consultants by the EOU. The evaluator should have the following qualifications:

The evaluator should not have been associated with the design and implementation of the project in a paid capacity. The evaluator will work under the overall supervision of the Chief, Evaluation and Oversight Unit, UNEP. The evaluator should be an international expert in {} with a sound understanding of {} issues. The consultant should have the following minimum qualifications: (i) experience in {} issues; (ii) experience with management and implementation of {} projects and in particular with {} targeted at policy-influence and decision-making; (iii) experience with project evaluation. Knowledge of UNEP programmes and GEF activities is desirable. Knowledge of {specify language(s)} is an advantage. Fluency in oral and written English is a must.

6. Schedule Of Payment

The consultant shall select one of the following two contract options:

Lump-Sum Option

The evaluator will receive an initial payment of 30% of the total amount due upon signature of the contract. A further 30% will be paid upon submission of the draft report. A final payment of 40% will be made upon satisfactory completion of work. The fee is payable under the individual Special Service Agreement (SSA) of the evaluator and is **inclusive** of all expenses such as travel, accommodation and incidental expenses.

Fee-only Option

The evaluator will receive an initial payment of 40% of the total amount due upon signature of the contract. Final payment of 60% will be made upon satisfactory completion of work. The fee is payable under the individual SSAs of the evaluator and is **NOT** inclusive of all expenses such as travel, accommodation and incidental expenses. Ticket and DSA will be paid separately.

In case, the evaluator cannot provide the products in accordance with the TORs, the timeframe agreed, or his products are substandard, the payment to the evaluator could be withheld, until such a time the

products are modified to meet UNEP's standard. In case the evaluator fails to submit a satisfactory final product to UNEP, the product prepared by the evaluator may not constitute the evaluation report.
Annex 1 to Appendix 9: OVERALL RATINGS TABLE

Criterion	Evaluator's Summary Comments	Evaluator's Rating
A. Attainment of project objectives and results (overall rating) Sub criteria (below)		
A. 1. Effectiveness		
A. 2. Relevance		
A. 3. Efficiency		
B. Sustainability of Project outcomes (overall rating) Sub criteria (below)		
B. 1. Financial		
B. 2. Socio Political		
B. 3. Institutional framework and governance		
B. 4. Ecological		
C. Achievement of outputs and activities		
D. Monitoring and Evaluation (overall rating) Sub criteria (below)		
D. 1. M&E Design		
D. 2. M&E Plan Implementation (use for adaptive management)		
D. 3. Budgeting and Funding for M&E activities		
E. Catalytic Role		
F. Preparation and readiness		
G. Country ownership / drivenness		
H. Stakeholders involvement		
I. Financial planning		
J. Implementation approach		
K. UNEP Supervision and backstopping		

RATING OF PROJECT OBJECTIVES AND RESULTS

Highly Satisfactory (HS): The project had no shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.

Satisfactory (S): The project had minor shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.

Moderately Satisfactory (MS): The project had moderate shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.

Moderately Unsatisfactory (MU): The project had significant shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.

Unsatisfactory (U) The project had major shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.

Highly Unsatisfactory (HU): The project had severe shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.

Please note: Relevance and effectiveness will be considered as critical criteria. The overall rating of the project for achievement of objectives and results **may not be higher** than the lowest rating on

either of these two criteria. Thus, to have an overall satisfactory rating for outcomes a project must have at least satisfactory ratings on both relevance and effectiveness.

RATINGS ON SUSTAINABILITY

A. Sustainability will be understood as the probability of continued long-term outcomes and impacts after the GEF project funding ends. The Terminal evaluation will identify and assess the key conditions or factors that are likely to contribute or undermine the persistence of benefits after the project ends. Some of these factors might be outcomes of the project, i.e. stronger institutional capacities, legal frameworks, socio-economic incentives /or public awareness. Other factors will include contextual circumstances or developments that are not outcomes of the project but that are relevant to the sustainability of outcomes.

Rating system for sustainability sub-criteria

On each of the dimensions of sustainability of the project outcomes will be rated as follows.

Likely (L): There are no risks affecting this dimension of sustainability.

Moderately Likely (ML). There are moderate risks that affect this dimension of sustainability.

Moderately Unlikely (MU): There are significant risks that affect this dimension of sustainability

Unlikely (U): There are severe risks that affect this dimension of sustainability.

According to the GEF Office of Evaluation, all the risk dimensions of sustainability are deemed critical. Therefore, overall rating for sustainability will not be higher than the rating of the dimension with lowest ratings. For example, if a project has an Unlikely rating in any of the dimensions then its overall rating cannot be higher than Unlikely, regardless of whether higher ratings in other dimensions of sustainability produce a higher average.

RATINGS OF PROJECT M&E

Monitoring is a continuing function that uses systematic collection of data on specified indicators to provide management and the main stakeholders of an ongoing project with indications of the extent of progress and achievement of objectives and progress in the use of allocated funds. Evaluation is the systematic and objective assessment of an on-going or completed project, its design, implementation and results. Project evaluation may involve the definition of appropriate standards, the examination of performance against those standards, and an assessment of actual and expected results.

The Project monitoring and evaluation system will be rated on ‘M&E Design’, ‘M&E Plan Implementation’ and ‘Budgeting and Funding for M&E activities’ as follows:

Highly Satisfactory (HS): There were no shortcomings in the project M&E system.

Satisfactory(S): There were minor shortcomings in the project M&E system.

Moderately Satisfactory (MS): There were moderate shortcomings in the project M&E system.

Moderately Unsatisfactory (MU): There were significant shortcomings in the project M&E system.

Unsatisfactory (U): There were major shortcomings in the project M&E system.

Highly Unsatisfactory (HU): The Project had no M&E system.

“M&E plan implementation” will be considered a critical parameter for the overall assessment of the M&E system. The overall rating for the M&E systems will not be higher than the rating on “M&E plan implementation.”

All other ratings will be on the GEF six point scale.

GEF Performance Description	Alternative description on the same scale
HS = Highly Satisfactory	Excellent

S	= Satisfactory	Well above average
MS	= Moderately Satisfactory	Average
MU	= Moderately Unsatisfactory	Below Average
U	= Unsatisfactory	Poor
HU	= Highly Unsatisfactory	Very poor (Appalling)

Annex 2 to Appendix 9: Co-financing and Leveraged Resources
Co-financing (basic data to be supplied to the consultant for verification)

* Other is referred to contributions mobilized for the project from other multilateral agencies, bilateral development cooperation agencies, NGOs, the private sector and beneficiaries.

Co financing (Type/Source)	IA own Financing (mill US\$)		Government (mill US\$)		Other* (mill US\$)		Total (mill US\$)		Total Disbursement (mill US\$)	
	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual
- Grants										
- Loans/Concessional (compared to market rate)										
- Credits										
- Equity investments										
- In-kind support										
- Other (*)										
-										
-										
-										
-										
Totals										

Leveraged Resources

Leveraged resources are additional resources—beyond those committed to the project itself at the time of approval—that are mobilized later as a direct result of the project. Leveraged resources can be financial or in-kind and they may be from other donors, NGO’s, foundations, governments, communities or the private sector. Please briefly describe the resources the project has leveraged since inception and indicate how these resources are contributing to the project’s ultimate objective.

Table showing final actual project expenditure by activity to be supplied by the UNEP Fund management Officer. (insert here)

Annex 3 to Appendix 9

Review of the Draft Report

Draft reports submitted to UNEP EOU are shared with the corresponding Programme or Project Officer and his or her supervisor for initial review and consultation. The DGEF staff and senior Executing Agency staff provide comments on the draft evaluation report. They may provide feedback on any errors of fact and may highlight the significance of such errors in any conclusions. The consultation also seeks agreement on the findings and recommendations. UNEP EOU collates the review comments and provides them to the evaluators for their consideration in preparing the final version of the report. General comments on the draft report with respect to compliance with these TOR are shared with the reviewer.

Quality Assessment of the Evaluation Report

All UNEP GEF Mid Term Reports are subject to quality assessments by UNEP EOU. These apply GEF Office of Evaluation quality assessment and are used as a tool for providing structured feedback to the evaluator.

The quality of the draft evaluation report is assessed and rated against the following criteria:

GEF Report Quality Criteria	UNEP EOU Assessment	Rating
A. Did the report present an assessment of relevant outcomes and achievement of project objectives in the context of the focal area program indicators if applicable?		
B. Was the report consistent and the evidence complete and convincing and were the ratings substantiated when used?		
C. Did the report present a sound assessment of sustainability of outcomes?		
D. Were the lessons and recommendations supported by the evidence presented?		
E. Did the report include the actual project costs (total and per activity) and actual co-financing used?		
F. Did the report include an assessment of the quality of the project M&E system and its use for project management?		
UNEP EOU additional Report Quality Criteria	UNEP EOU Assessment	Rating
G. Quality of the lessons: Were lessons readily applicable in other contexts? Did they suggest prescriptive action?		
H. Quality of the recommendations: Did recommendations specify the actions necessary to correct existing conditions or improve operations ('who?' 'what?' 'where?' 'when?'). Can they be implemented? Did the recommendations specify a goal and an associated performance indicator?		
I. Was the report well written? (clear English language and grammar)		
J. Did the report structure follow EOU guidelines, were all requested Annexes included?		
K. Were all evaluation aspects specified in the TORs adequately addressed?		
L. Was the report delivered in a timely manner		

GEF Quality of the MTE report = 0.3*(A + B) + 0.1*(C+D+E+F)

EOU assessment of MTE report = 0.3*(G + H) + 0.1*(I+J+K+L)

Combined quality Rating = (2* 'GEF EO' rating + EOU rating)/3

The Totals are rounded and converted to the scale of HS to HU

Rating system for quality of terminal evaluation reports

A number rating 1-6 is used for each criterion: Highly Satisfactory = 6, Satisfactory = 5, Moderately Satisfactory = 4, Moderately Unsatisfactory = 3, Unsatisfactory = 2, Highly Unsatisfactory = 1, and unable to assess = 0.

Annex 4 to Appendix 9

GEF Minimum requirements for M&E

*Minimum Requirement 1: Project Design of M&E*⁵²

All projects must include a concrete and fully budgeted monitoring and evaluation plan by the time of Work Program entry (full-sized projects) or CEO approval (medium-sized projects).

This plan must contain at a minimum:

- SMART (see below) indicators for project implementation, or, if no indicators are identified, an alternative plan for monitoring that will deliver reliable and valid information to management
- SMART indicators for results (outcomes and, if applicable, impacts), and, where appropriate, corporate-level indicators
- A project baseline, with:
 - a description of the problem to address
 - indicator data
 - or, if major baseline indicators are not identified, an alternative plan for addressing this within one year of implementation
- An M&E Plan with identification of reviews and evaluations which will be undertaken, such as mid-term reviews or evaluations of activities
- An organizational setup and budgets for monitoring and evaluation.

Minimum Requirement 2: Application of Project M&E

- Project monitoring and supervision will include implementation of the M&E plan, comprising:
- Use of SMART indicators for implementation (or provision of a reasonable explanation if not used)
- Use of SMART indicators for results (or provision of a reasonable explanation if not used)
- Fully established baseline for the project and data compiled to review progress
- Evaluations are undertaken as planned
- Operational organizational setup for M&E and budgets spent as planned.

SMART INDICATORS GEF projects and programs should monitor using relevant performance indicators. The monitoring system should be “SMART”:

1. **Specific:** The system captures the essence of the desired result by clearly and directly relating to achieving an objective, and only that objective.
2. **Measurable:** The monitoring system and its indicators are unambiguously specified so that all parties agree on what the system covers and there are practical ways to measure the indicators and results.
3. **Achievable and Attributable:** The system identifies what changes are anticipated as a result of the intervention and whether the result(s) are realistic. Attribution requires that changes in the targeted developmental issue can be linked to the intervention.
4. **Relevant and Realistic:** The system establishes levels of performance that are likely to be achieved in a practical manner, and that reflect the expectations of stakeholders.
5. **Time-bound, Timely, Trackable, and Targeted:** The system allows progress to be tracked in a cost-effective manner at desired frequency for a set period, with clear identification of the particular stakeholder group to be impacted by the project or program.

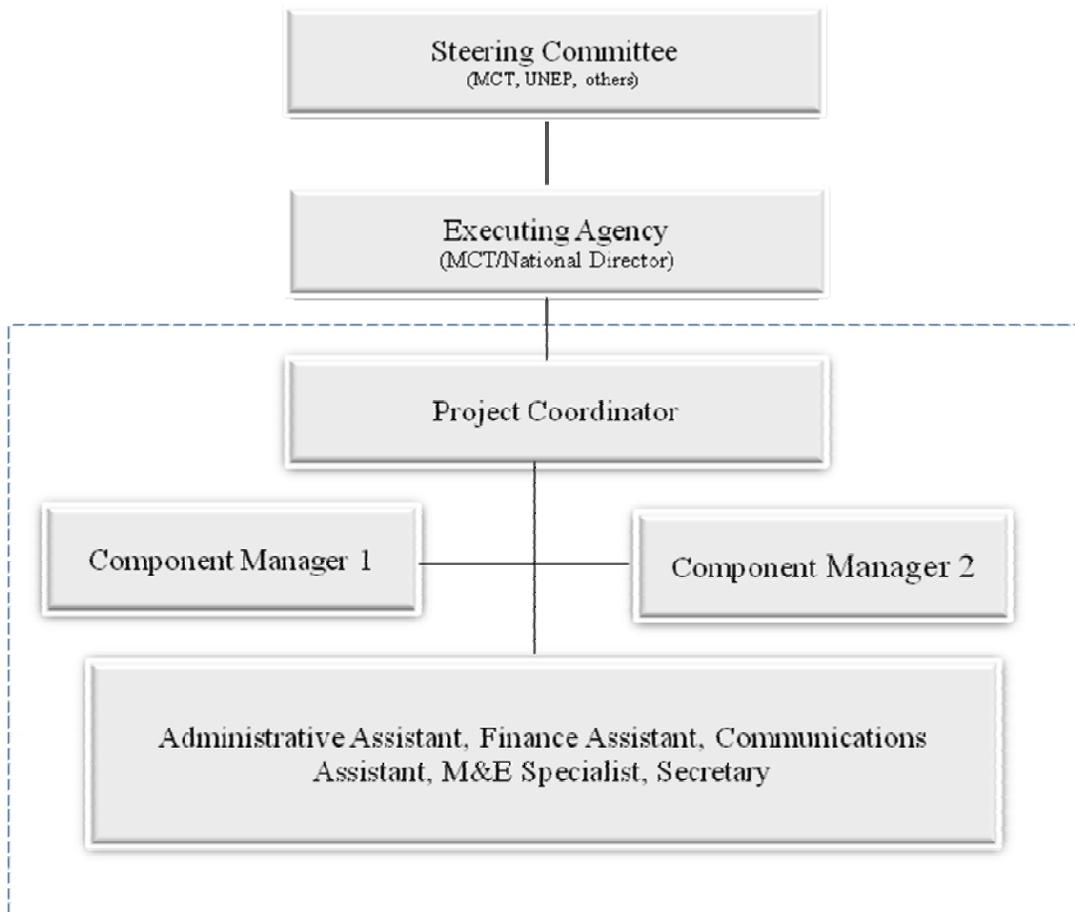
⁵² <http://gefweb.org/MonitoringandEvaluation/MEPoliciesProcedures/MEPTools/meptstandards.html>

Annex 5 to Appendix 9

List of intended additional recipients for the Terminal Evaluation (to be completed by the IA Task Manager)

Name	Affiliation	Email
Aaron Zazueta	GEF Evaluation Office	azazueta@thegef.org
Government Officials		
GEF Focal Point(s)		
Executing Agency		
Implementing Agency		
Carmen Tavera	UNEP DGEF Quality Assurance Officer	

Appendix 10: Decision-making flowchart and organizational chart



Appendix 11: Terms of Reference

- i. Project Coordinator
- ii. Component Managers
- iii. M&E Specialist
- iv. Project Administrative/Financial Assistant
- v. Project Secretary
- vi. Communication Assistant

i. Project Coordinator

The Project Coordinator will act as the head of the PMU and will be responsible for overall project implementation and supervision of the PMU staff. The Project Coordinator will work under the supervision of the National Director and will coordinate with the Executing Agency as well as other concerned stakeholders to ensure adequate project implementation.

Main duties and responsibilities:

- Establish the PMU's internal working procedures and coordination mechanisms with the Executing Agency and project steering committee (PSC).
- Supervise the activities of the PMU staff, including analysis and approval of workplans and activity reports.
- Ensure adequate compliance of project implementation with UNEP-GEF procedures.
- Prepare the annual workplans and budgets and submit them for approval of the Executing Agency and Project Steering Committee.
- Supervise drafting of TORs for project activities, analyze and approve technical reports.
- Prepare project progress reports as required by UNEP/GEF.
- Design the project's M&E system and ensure adequate project M&E.
- Provide support to field missions by UNEP staff as well as to Mid-Term and Final External Evaluations.
- Carry out visits to the project stakeholders as part of the overall supervision of project implementation and prepare visit reports.
- Ensure adequate inter-institutional coordination and stakeholder participation mechanisms during project implementation.
- Act as Secretary to the meetings of the Project Steering Committee.
- Prepare the project's visibility plan and ensure adequate dissemination of project results and lessons learned.
- Prepare monthly work plans and activity reports and submit them for approval of the National Director and UNEP.

Profile: At least 8 years of experience in project management and implementation, as well as significant direct experience related to the scope of the project; experience in environmental governance and capacity building issues is highly desirable; leadership as well as strong management and interpersonal skills; computer skills; high flexibility and capacity to work under pressure.

ii. Component Managers

Component Managers (CMs) will be responsible for coordination and implementation of project components. The CMs will work under the supervision of the Project Coordinator and will coordinate with the Executing Agency as well as other concerned stakeholders to ensure adequate project component implementation.

Main duties and responsibilities:

- Comply with PMU internal working procedures and agreed coordination mechanisms, ensuring adequate compliance of project implementation with UNEP-GEF procedures.

- Hold regular coordination meetings with the Project Coordinator and participate in meetings of working groups established within the project framework as well as those of the project steering committee.
- Provide support to the Project Coordinator and Executing Agency for preparation of the annual workplans and budgets.
- Draft TORs for project activities, analyze and review technical reports by consultants and local implementing agencies.
- Provide support to the Project Coordinator for preparation of project progress reports as required by UNEP/GEF.
- Implement the M&E plan.
- Provide support to Mid-Term and Final External Evaluations.
- Provide support to implementation of the project's visibility plan and dissemination of project results and lessons learned.
- Prepare monthly work plans and activity reports and submit them for approval of the Project Coordinator.
- Follow and implement the specific timetable/activities/benchmarks for each component.

Profile: At least 5 years of working experience with significant direct experience related to the scope of the project; experience in project cycle management is highly desirable; computer skills; initiative and responsibility; teamwork ability, high flexibility and capacity to work under pressure.

iii. M&E Specialist (part-time)

The M&E Specialist will be responsible for design, coordination and implementation of the SIBBr and project M&E plan. The specialist will work under the supervision of the Project Coordinator and will coordinate with the Executing Agency as well as other concerned stakeholders to ensure adequate implementation of the M&E plan.

Main duties and responsibilities:

- Work together with the M&E international specialist to design the SIBBr and project's internal M&E systems, taking into account the M&E instruments (logical framework, workplan and timetable, key deliverables and benchmarks, etc.)
- Implement the M&E plan.
- Comply with PMU internal working procedures and agreed coordination mechanisms, ensuring adequate compliance of project implementation with UNEP-GEF procedures.
- Hold regular coordination meetings with the Project Coordinator and participate in meetings of working groups established within the project framework as well as those of the project steering committee.
- Provide support to the Project Coordinator and Executing Agency for preparation of the annual workplans and budgets.
- Provide support to the Project Coordinator for preparation of project progress reports as required by UNEP/GEF.
- Provide support to Mid-Term and Final External Evaluations.
- Provide support to implementation of the project's visibility plan and dissemination of project results and lessons learned.
- Prepare monthly work plans and activity reports and submit them for approval of the Project Coordinator.

Profile: At least 5 years of working experience with significant direct experience related to M&E; experience in project cycle management is highly desirable; computer skills; initiative and responsibility; teamwork ability, high flexibility and capacity to work under pressure.

iv. Project Administrative/Financial Assistant

The Administrative/Financial Assistant (AFA) will be stationed in the PMU and will be responsible for project administrative and financial management. The AFA will work under the supervision of the Project Coordinator and will coordinate with Component Managers and Executing Agency to ensure adequate project management.

Main duties and responsibilities:

- Ensure adequate administrative and financial management in accordance with UNEP procedures.
- Hold regular meetings with the Project Coordinator regarding management issues and maintain regular contact with the Component Managers and Executing Agency on administrative and financial issues.
- Draft correspondence related to administrative and financial issues.
- Provide assistance in preparing annual workplans and budgets.
- Monthly accounts and financial reports, and bookkeeping.
- Prepare disbursement requests and keep track of project disbursements.
- Procurement of goods and services, including preparation of bidding documents, specifications and contracts.
- Management of administrative, accounting and financial files
- Provide support to project audits and external evaluations.

Profile: At least 5 years of experience in accounting and financial matters; experience in project administrative and financial management; acquaintance with UNEP procedures is highly desirable; computer skills; initiative and responsibility; teamwork ability, high flexibility and capacity to work under pressure.

v. Project Secretary

The Secretary will be stationed in the PMU and will be responsible for providing secretarial and administrative support to project management. The Secretary will work under the supervision of the Project Coordinator and will coordinate with the AFA and CMs to ensure adequate project management.

Main duties and responsibilities:

- Management of telephone calls and messages.
- Management of correspondence, including drafting of letters, registry, and filing.
- Management of the agenda of the Project Coordinator.
- Classification and filing of correspondence and documents.
- Provide support in preparation of project reports and documents.
- Provide support in administrative and financial procedures.
- Provide support to field missions of the Project Coordinator, CMs, UNEP staff, and assist with Mid-Term and Final External Evaluations.
- Provide support to organization and realization of meetings, including acting as secretary and drafting of minutes.
- Provide support to organization and realization of activities for visibility and dissemination of information.

Profile: At least 3 years of working experience; experience in project management highly desirable; computer skills; initiative and responsibility; teamwork ability, high flexibility and capacity to work under pressure.

vi. Communication Assistant

The Communication Assistant will be stationed in the PMU and will be responsible for providing support to project visibility, outreach and awareness raising activities. The

Communication Assistant will work under the supervision of the Project Coordinator and will coordinate with the AFA and CMs to ensure adequate project management.

Main duties and responsibilities:

- Comply with PMU internal working procedures and agreed coordination mechanisms, ensuring adequate compliance of project implementation with UNDP and UNEP procedures.
- Hold regular coordination meetings with the Project Coordinator and participate in meetings of working groups established within the project framework as well as those of the local steering committees.
- Provide support to the Project Coordinator and Executing Agencies for preparation of the annual workplans and budgets.
- Provide inputs and support to implementation of the project's visibility plan and dissemination of project results and lessons learned.
- Prepare and/or update the project dissemination material (bulletins, website, brochures, among others)
- Coordinate the creation of training material and any other communication information in demand.

Profile: At least 5 years of working experience with significant direct experience related to the scope of the project and communication; computer skills; graphics skills, initiative and responsibility; teamwork ability, high flexibility and capacity to work under pressure.

Appendix 12: Co-financing commitment letters from project partners

Appendix 13: Endorsement letters of GEF National Focal Points

Appendix 14: Draft procurement plan

UNEP Budget Line		
10	PERSONNEL COMPONENT	
1100	Project personnel	732.000
1200	Consultants	345.000
1999	Component total	1.077.000
20	SUB-CONTRACT COMPONENT	
2200	Sub-contracts (MOUs/LOAs for supporting organizations)	2.517.500
2300	Sub-contracts (for commercial purposes)	2.160.000
2999	Component total	4.677.500
40	EQUIPMENT AND PREMISES COMPONENT	
4200	Non-expendable equipment	75.000
4999	Component total	75.000
50	MISCELLANEOUS COMPONENT	
5500	Evaluation	100.000
5999	Component total	100.000
99	GRAND TOTAL	5.929.500

Appendix 15: Tracking Tools

GEF-4 Tracking Tool for GEF Biodiversity Focal Area Strategic Objective Two: Mainstreaming Biodiversity Conservation in Production Landscapes/Seascapes and Sectors



I. Project General Information

1. Project Name: *Improving Brazilian Capacity to Conserve and Use Biodiversity through Information Management and use*
2. Project Type (MSP or FSP): *FSP*
3. Project ID (GEF): *3722*
4. Project ID (IA):
5. Implementing Agency: *UNEP*
6. Country(ies): *Brazil*

Name of reviewers completing tracking tool and completion dates:

	Name	Title	Agency
Work Program Inclusion	David Oren	Biodiversity Coordinator	Ministry for Science and Technology
Project Mid-term			
Final Evaluation/project completion			

7. Project duration: **Planned:** 5 years **Actual:**
8. Lead Project Executing Agency (ies): *Ministry of Science and Technology*
9. GEF Strategic Program: *SO2, SP4*

10. Production sectors and/or ecosystem services directly targeted by project:

10. a. Please identify the main production sectors involved in the project. Please put “P” for sectors that are primarily and directly targeted by the project and “S” for those that are secondary or incidentally affected by the project.

Agriculture: ___ S ___
 Fisheries ___ S ___
 Forestry ___ S ___
 Tourism ___ S ___
 Mining ___ S ___
 Oil ___ S ___
 Transportation ___ S ___
 Other (please specify) _____

II. Project Landscape/Seascape Coverage

11. a. What is the extent (in hectares) of the landscape or seascape where the project will directly or indirectly contribute to biodiversity conservation or sustainable use of its components?

Not Applicable

Targets and Timeframe	Foreseen at project start	Achievement at Mid-term Evaluation of Project	Achievement at Final Evaluation of Project
Project Coverage			
Landscape area <u>directly</u> covered by the project (ha)	N/A		
Landscape area <u>indirectly</u> covered by the project (ha)	N/A		

11. b. Are there Protected Areas within the landscape covered by the project? If so, name these PAs, their IUCN or national PA category, and their extent in hectares.

Not Applicable

	Name of Protected Areas	IUCN and/or national category of PA	Extent in hectares of PA

(*) and (**): PAs with Project interventions (surface areas refer to extension of the PAs)

(***) Project interventions foreseen within the Biosphere Reserve to establish a biological corridor between Teniente Enciso and Medanos del Chaco National Parks (surface area refers to possible area of the corridor)

11. c. Within the landscape/seascape covered by the project, is the project implementing payment for environmental service schemes? If so, please complete the table below. An example is provided.

Not Applicable

III. Management Practices Applied

12.a. Within the scope and objectives of the project, please identify in the table below the management practices employed by project beneficiaries that integrate biodiversity considerations and the area of coverage of these management practices. Please also note if a certification system is being applied and identify the certification system being used. Note: this could range from farmers applying organic agricultural practices, forest management agencies managing forests per Forest Stewardship Council (FSC) guidelines or other forest certification schemes, artisanal fisherfolk practicing sustainable fisheries management, or industries satisfying other similar agreed international standards, etc. An example is provided in the table below.

Not Applicable

Specific management practices that integrate BD	Name of certification system being used (insert NA if no certification system is being applied)	Area of coverage foreseen at start of project	Achievement at Mid-term Evaluation of Project	Achievement at Final Evaluation of Project

Specific management practices that integrate BD	Name of certification system being used (insert NA if no certification system is being applied)	Area of coverage foreseen at start of project	Achievement at Mid-term Evaluation of Project	Achievement at Final Evaluation of Project

IV. Market Transformation

13. For those projects that have identified market transformation as a project objective, please describe the project's ability to integrate biodiversity considerations into the mainstream economy by measuring the market changes to which the project contributed. The sectors and subsectors and measures of impact in the table below are illustrative examples, only. Please complete per the objectives and specifics of the project.

Not Applicable

V. Policy and Regulatory frameworks

For those projects that have identified addressing policy, legislation, regulations, and their implementation as project objectives, please complete the following series of questions: 14a, 14b, 14c.

An example for a project that focused on the agriculture sector is provided in 14 a, b, and c.

14. a. Please complete this table at CEO endorsement for each sector that is a primary or a secondary focus of the project.

Please answer YES or NO to each statement under the sectors that are a focus of the project.

Sector	Agriculture	Fisheries	Forestry	Tourism	Other (productive sectors)	Other (please specify)
Statement: Please answer YES or NO for each sector that is a focus of the project.						
Biodiversity considerations are mentioned in sector policy					YES	
Biodiversity considerations are mentioned in sector policy through specific legislation					YES	
Regulations are in place to implement the legislation					YES	
The regulations are under implementation					YES	
The implementation of regulations is enforced					YES	
Enforcement of regulations is monitored					YES	

14. b . Please complete this table at **the project mid-term for each sector** that is a primary or a secondary focus of the project. Please answer YES or NO to each statement under the sectors that are a focus of the project.

Sector	Agriculture	Fisheries	Forestry	Tourism	Other (please specify)	Other (please specify)
Statement: Please answer YES or NO for each sector that is a focus of the project.						
Biodiversity considerations are mentioned in sector policy						
Biodiversity considerations are mentioned in sector policy through specific legislation						
Regulations are in place to implement the legislation						
The regulations are under implementation						
The implementation of regulations is enforced						
Enforcement of regulations is monitored						

14. c. Please complete this table at **project closure for each sector** that is a primary or a secondary focus of the project. Please answer YES or NO to each statement under the sectors that are a focus of the project.

Sector	Agriculture	Fisheries	Forestry	Tourism	Other (please specify)	Other (please specify)
Statement: Please answer YES or NO for each sector that is a focus of the project.						
Biodiversity considerations are mentioned in sector policy						
Biodiversity considerations are mentioned in sector policy through specific legislation						
Regulations are in place to implement the legislation						
The regulations are under implementation						
The implementation of regulations is enforced						
Enforcement of regulations is monitored						

All projects please complete this question at the project mid-term evaluation and at the final evaluation, if relevant:

14. d. Within the scope and objectives of the project, has the private sector undertaken voluntary measures to incorporate biodiversity considerations in production? If yes, please provide brief explanation and specifically mention the sectors involved.

An *example* of this could be a mining company minimizing the impacts on biodiversity by using low-impact exploration techniques and by developing plans for restoration of biodiversity after exploration as part of the site management plan.

VI. Other Impacts

16. Please briefly summarize other impacts that the project has had on mainstreaming biodiversity that have not been recorded above.

Appendix 16: Biodiversity of Brazil

Brazilian biodiversity

1. Brazil is one of the most biodiverse countries in the world accounting for approximately 13 percent of the world's terrestrial biota and containing between 170,000 and 210,000 described species⁵³. Of course, there are also many species yet to be discovered and described, especially in the vast tropical forests of the Amazon and the real figures for total species richness have been estimated to be somewhere between 1.4 to 2.4 million species⁵⁴. The marine habitat of Brazil, though less diverse and with lower rates of endemism, still contains vast numbers of fish and invertebrates some of which are threatened with over-exploitation⁵⁵.
2. Brazil has a particularly rich flora and over 56,000 plant species (excluding fungi) have been recorded from within the country representing almost 20 percent of all known plant species⁵⁶. In 1998 MMA estimated that Brazil contains approximately 5–10 species of gymnosperms, 55,000–60,000 species of angiosperms, 3100 species of bryophytes, 1200–1300 species of pteridophytes, and about 525 species of marine algae⁵⁷. The largest families in Brazil in terms of numbers of species are Leguminosae (3200 species, 2144 of which are endemic), Asteraceae (1900), Euphorbiaceae (1100), Myrtaceae (1038), and Rubiaceae (1000).
3. Brazil's fauna is similarly rich and, with over 530 described species, has the highest mammal diversity of any country⁵⁸. Other vertebrate groups are also well represented with over 650 reptiles, 760 amphibian species, 1690 bird species and 3400 fish species recorded within national boundaries. However, these figures are dwarfed by the number of arthropods for which there are over 100,000-recorded species and probably over a million species yet to be discovered.

Areas of global conservation significance

4. The Atlantic forests, the Cerrado and Western Amazon have been designated as biodiversity hotspots by the international conservation NGO Conservation International due to their high biodiversity and endemism⁵⁹.
5. The Cerrado region of Brazil, comprising 21 percent of the country, is the most extensive woodland-savanna in South America. It is also one of the richest of all tropical savanna regions and has high levels of endemism being home to approximately 10,000 plant species (4,400 endemic), 600 birds (20 endemic), 200 mammals (14 endemic), 220 reptiles (30 endemic) and 800 freshwater fish (200 endemic species and 20 endemic genera)⁶⁰. The hotspot also contains two of BirdLife International's Endemic Bird Areas⁶¹. There is little information on insect diversity in the Cerrado,

⁵³ Lewinsohn, T.M., Prado, P.I. (2005) How Many Species Are There in Brazil? *Conservation Biology*, **19**, 619-624.

⁵⁴ Lewinsohn, T.M., Prado, P.I. (2002) Biodiversidade brasileira: síntese do estado atual do conhecimento. Editora Contexto, São Paulo (in Portuguese).

⁵⁵ Amaral, A.C.Z., Jablonski, S. (2005) Conservation of Marine and Coastal Biodiversity in Brazil. *Conservation Biology*, **19**, 625-631.

⁵⁶ Giulietti, A.M., Harley, R.M., Paganucci de Queiroz, L., Wanderley, M.G.L. & Van Den Berg, C. (2005) Biodiversity and Conservation of Plants in Brazil. *Conservation Biology*, **19**, 632-639.

⁵⁷ MMA (1998) Primeiro relatório nacional para a Convenção sobre Diversidade Biológica. MMA, Brasília (in Portuguese).

⁵⁸ Costa, L.P., Leite, Y.L.R., Mendes, S.L., Ditchfield, A.D. (2005) Mammal Conservation in Brazil. *Conservation Biology*, **19**, 672-679.

⁵⁹ Myers, N., Mittermeier, R.A., Mittermeier, C.G., da Fonseca, G.A.B., Kent, J. (2000) Biodiversity hotspots for conservation priorities. *Nature*, **403**, 853-858.

⁶⁰ Klink, C.A. & Machado, R.B. (2005) Conservation of the Brazilian Cerrado. *Conservation Biology*, **19**, 7070-713.

⁶¹ http://www.birdlife.org/datazone/search/ebas_search.html?action=EbaHTMLFindResults.asp&INam=&Reg=11&Cty=30

although preliminary data suggest that as many as a quarter of the 40,000 known species of Neotropical butterflies and moths are found here in addition to many other high diversity taxa.

6. The Atlantic Forest of Brazil was biogeographically isolated from other South American tropical forests by the savannas and woodlands of the Cerrado for thousands of years driving an exceptionally high level of biodiversity and endemism. Of 20,000 vascular plant species occurring there, a remarkable 40 percent of approximately 8,000 species are endemic. Endemism in tree species is particularly high, with more than half the species found nowhere else. The fauna of the Atlantic forest shows correspondingly high levels of diversity and endemism. There are approximately 930 species of bird, of which 15 percent are endemic including a staggering 23 endemic genera. BirdLife International has identified four Endemic Bird Areas (EBAs) in the hotspot. Furthermore, there are 260 species of mammals (70 endemic), more than 300 reptile species (95 endemic) and at least 350 fish species (133 endemic).

7. The remarkable diversity of Brazil's Atlantic Forest has been retained despite the fact that less than 10 percent of the original area of the forest remains⁶². This enormous area reduction has had important ecological consequences. For example, many of the vertebrate species in this region are of global conservation concern and more than 20 are considered Critically Endangered under the IUCN's Red List of Threatened Species.

Threats to biodiversity

8. This biological richness however is threatened by biodiversity loss driven by habitat destruction and fragmentation, invasive species, over-exploitation and pollution. Specifically, widespread agricultural expansion (including forestry and conversion to pastures), road construction, and mining have been particularly important in driving population decline and species disappearance. Furthermore, a second set of factors such as hunting, overexploitation of timber and fuel wood, illegal trading of plants and animals, chemical pollution, oil exploration, hydroelectric projects, and unsustainable tourism are locally significant. The root causes of biodiversity loss in Brazil are related to demographic change, inequality and poverty, macroeconomic policies, social changes, and unsustainable development.

9. The above processes have led to massive changes in natural ecosystems over the last century. More than 90 percent of the Atlantic Forest biome, half of the Cerrado and Caatinga biomes, and approximately 20 percent of the Amazon Forest biome are already deforested; large numbers of biodiversity components in Brazil are in danger of becoming extinct in the near future. Currently, more than 600 animal species are officially recognized by the Brazilian government as threatened with extinction - this includes 79 threatened aquatic invertebrate species, 10 overexploited aquatic invertebrates, 130 threatened terrestrial invertebrates, 159 threatened fish, 47 overexploited fish, 20 threatened reptiles, 16 threatened amphibians, 160 threatened birds, and 69 threatened mammals.

⁶² da Fonseca, G.A.B. (1985) The vanishing Brazilian Atlantic Forest. *Biological Conservation*, **34**, 17-34.

Appendix 17: Stakeholder Matrix

Stakeholder	Main Interest	Specific interest in SIBBr
GEF (Funding Organization)	Financial interventions dealing with the management of natural resources with multiple global environmental benefits expected	GEF has identified a need for strengthening the policy regulatory framework for mainstreaming biodiversity (SP4). SIBBr directly responds to this need by providing a tool for mainstreaming biodiversity data in Brazil.
UNEP (Implementing Agency)	Plays a central role in major environmental assessments	SIBBr supports UNEP's mission to 'analyse the state of the global environment, assess global and regional environmental trends, and provide early warning on environmental threats, based on the best scientific and technical capabilities available' ⁶³ .
Ministry of Science and Technology (MCT) -Executing Agency	MCT is the main governmental body responsible for research and development of scientific projects in Brazil. MCT is also responsible for the following organizations: <ul style="list-style-type: none"> National Institute for Amazonian (INPA) and Emilio Goeldi Museum (MPEG): research and teaching, herbaria and zoological collections National Institute for Space Science (INPE): leads research in geospatial information, remote sensing and monitoring of deforestation Brazilian Institute for Information on Science and Technology (IBICT): responsible for the integration of general scientific information systems including biodiversity, research and bibliographic databases. 	MCT has a major strategic objective to provide authoritative, strategic and timely information to support decision-makers in the development and implementation of their policies and strategic planning, providing the means to make better executive choices about the conservation of biodiversity in Brazil. INPA, MPEG, INPE, IBICT and other MCT institutions will provide data for SIBBr and will benefit from the integrated information system and associated tools. Specifically, with respect to teaching, research, capacity building, environmental monitoring, etc.
Ministry of Environment (MMA)	MMA is responsible for policy, research, licensing and monitoring of the natural environment. The most relevant MMA institutions for the SIBBr project are: <ul style="list-style-type: none"> Botanic Garden of Rio de Janeiro (JBRJ). Responsible for the checklist of plants from Brazil. Brazilian Institute for the Environment and Renewable Natural Resources (IBAMA). Secretariat of Biodiversity and Forestry (SBF). Maintains list of national conservation units. Chico Mendes Institute for the Conservation of Biodiversity (ICMBio). Responsible for CEMAVE (National research Center for Conservation of Wild Birds) and Project TAMAR (Conservation of 	MMA will benefit from SIBBr by gaining access to information that will directly feed into the National Protected Area Plan, annual updating of the Maps of Priority Areas for Conservation and Sustainable Use of Biodiversity, the preparation of management plans for endangered species, and the implementation of the Sustainable Amazon Plan. <ul style="list-style-type: none"> JBRJ will be a major data provider and will benefit from SIBBr in terms of teaching and research. IBAMA will also be a data provider and will be a major user of SIBBr to inform environmental licensing, monitoring and controlling use of natural resources SBF will be a data provider and will use SIBBr to inform policy and

⁶³ Stockholm Action Plan (1972) and Agenda 21, Chapter 38.

Stakeholder	Main Interest	Specific interest in SIBBr
	<p>Marine Turtles).</p> <ul style="list-style-type: none"> • Brazilian Forest Service (SFB). Maintains the national records for public forests. • General Coordinator of Information Technology and Informatics (CGTI). Maintain the BCDAM (Amazonian Database Sharing System) tools – i3Geo and SIGEPRO. Also maintain the PNLA (National Portal for Environmental Licensing). 	<p>decision concerning forest conservation and management, genetic resources, ecological corridors and protected areas.</p> <ul style="list-style-type: none"> • ICMBio will be a data provider through various projects (e.g. CEMAVE and TAMAR). It will use SIBBr to inform the development of rules and regulations for management of conservation units and support the national system of conservation units. Biodiversity information is also vital to ICMBio’s work in restoration of degraded areas and the integrated management of ecosystems and species. • SFB will be a data provider and will use SIBBr to inform the management and conservation of public forests. • CGTI will provide technical assistance in the design of SIBBr.
<p>Ministry of Agriculture, Livestock and Supply (MAPA)</p>	<p>MAPA is responsible for policy, research and development of Brazil’s agriculture. It is responsible for several important organizations within the SIBBr project:</p> <ul style="list-style-type: none"> • EMBRAPA-CNPTIA (Agricultural Information). Maintains databases for agricultural research (crops, livestock and biodiversity) and Infoteca (information on technologies developed by EMBRAPA). • EMBRAPA-CENARGEN. Maintains a germplasm bank organized in a national network of 35 research units and 70 partners. • EMBRAPA-CPATU (East Amazon). Maintains herbarium and online database of Amazonian trees. Contributes knowledge to sustainable use of natural resources. • EMBRAPA-CPAA (West Amazon). Maintains a database on Amazonian plant species. • EMBRAPA-IPA (Pernambuco State). Provides services for the sustainable development of agro-businesses. Maintains a herbarium with 73,000 records. • National Agricultural Library (BINAGRI). Maintains AGROBASE (National Agriculture Database) with 247,000 records including 12,000 records on biodiversity. Also maintains a database on agricultural 	<p>MAPA will benefit from SIBBr through greater access to biodiversity data to inform policies on sustainable agriculture and further integration of agricultural development with conservation priorities.</p> <ul style="list-style-type: none"> • EMBRAPA-CNPTIA will be a data provider. • EMBRAPA-CENARGEN will be a data provider and be part of the SIBBr network. • EMBRAPA-CPATU will be a data provider and will use SIBBr to assist in the creation of solutions for sustainable development of rural eastern Amazon. • EMBRAPA-CPAA will be a data provider and will use SIBBr to inform the development of various production systems including guaraná, rubber, cupuaçu, dendê, mandioc, Amazonian fish aquaculture, etc. • EMBRAPA-IPA will be a data provider and will benefit from SIBBr through using biodiversity information to inform the development of technology and technical assistance for small-holdings and agro-businesses. • BINAGRI will be a data provider and benefit from the improved capacity and infrastructure from SIBBr.

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	legislation and database on adapted technologies for small farms.	
Ministry of Planning, Budget and Management (MPOG)	The Ministry will be represented in SIBBr through the Brazilian Institute of Geography and Statistics (IBGE). IBGE maintains municipal socio-economic statistics and the environment in addition to various forms of cartographic data.	IBGE will be a major data provider of environmental, social and cultural data.
Ministry of National Integration (MIN)	This Ministry is represented in SIBBr through the Agency responsible for overseeing the development of the Amazon (SUDAM). SUDAM maintains the conservation and genetic information network for Amazonia and is concerned with planning, research and funding of conservation in the region. It also maintains a municipal database for the Amazon region.	SUDAM will be a data provider and will benefit from the information available from SIBBr in terms of better conservation planning and research.
Ministry of Health	This Ministry is represented in SIBBr through the Oswaldo Cruz Institute (FIOCRUZ) which does research on health strategies and maintains collections of micro-organisms, arthropods, molluscs and entomology.	FIOCRUZ will be a data provider and will benefit from increased access and usability of biodiversity data for health research.
Ministry of Mines and Energy (MME)	Responsible for energy policy and development with a focus on environmental sustainability.	Will use SIRRr information to elaborate plans to reduce the environmental impact of the development of electric power, exploration and production of oil and gas, exploitation of mineral resources, and the production of bio-combustibles.
National Teaching and Research Network (RNP)	RNP's mission is to operate an academic communications network of national reach. RNP supports one of the most advanced high-speed optic transmission internet infrastructures, known as <i>rede Ipê</i> . <i>Rede Ipê</i> links approximately 600 Brazilian institutions (private and public universities, research institutes, public institutions), regional and state networks.	SIBBr will utilize RNP's communications infrastructure and expertise to develop its information system and associated tools and applications.
Institute of Applied Economic Research (IPEA)	IPEA produces, articulates and disseminates knowledge about the improvement of public policy. It contributes to the planning of Brazilian economic development and maintains 7,000 data sets derived from updated national statistics.	IPEA will benefit from SIBBr through better access and mainstreaming of biodiversity data.
System for the Protection of Amazonia (SIPAM)	SIPAM is involved in the collection of cartographic information, geo-processing, remote sensing, and environmental monitoring in Amazonia. It also maintains a telecommunication net in the region.	SIPAM will be a data provider and will benefit from SIBBr in terms of access to information that will contribute to better protection of Amazon.
Ministry of Education (MEC) - Universities	All the federal and various state universities are engaged in research and teaching in biodiversity conservation, and some have	Many universities will act as important data providers.

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	<p>extensive herbaria and/or zoological collections. The most significant universities for the SIBBr project are:</p> <ul style="list-style-type: none"> • University of São Paulo. Herbarium with 184,000 species and a zoological museum. • UNICAMP / Institute of Biology. Herbarium with 143,000 species and a zoological collection. • Federal University of Rio de Janeiro / National Museum of Rio de Janeiro. Herbarium and zoological collection. • Federal University of Rio Grande do Sul. Herbarium with 146,000 specimens. • University of Brasilia / Institute of Biology. Herbarium with 208,000 specimens. • University of the Sinos Valley (Private) / Anchietao Research Institute. Herbarium with 120,000 specimens. • State University of Feira de Santana. Herbarium with 78,000 specimens. • Federal University of Pernambuco. Herbarium of fungi. • Federal University of Minas Gerais. Herbarium with 125,000 specimens. • Federal University of Goiás. Herbarium. • Federal University of Paraná. zoological collection (entomology section contains 5,000,000 specimens). 	<p>Brazilian universities will also benefit from SIBBr in a number of ways:</p> <ul style="list-style-type: none"> • Professors and teachers will be able to use the state-of-art visualization tools and freely accessible data to improve the quality of instruction. • Researchers in Brazil (and in the rest of the world) will have access to significantly more and better quality data on Brazilian biodiversity and will be able to search at national level for ongoing biodiversity initiatives. • Technicians in biological collections and university research institutes will benefit from focused training courses.
BUTANTAN Institute	BUTANTAN Institute comes under the control of the Secretary of Health for São Paulo and is a world leader in research on venomous animals. It maintains large collection of snakes and is a major producer of vaccines and antidotes.	The BUTANTAN Institute will be a data provider and will benefit from SIBBr in terms of better access to data for research.
Secretary of Environment for São Paulo (SEMA/SP)	SEMA/SP maintains the Institute of Botany (research and collections) and the zoological park.	SEMA/SP will be a data provider and will benefit from SIBBr in terms of better access to data for research.
Adolfo Lutz Institute	The Adolfo Lutz Institute is involved in research, training and applications in the areas of bromatology, biological medicine, and pathology.	The Adolfo Lutz Institute will be a data provider and will benefit from SIBBr in terms of better access to data for research.
Curitiba Botanic Museum	The Curitiba Botanic Museum is administrated through the Municipal Administration of Curitiba and maintains herbarium of 310,000 specimens.	The Museum will be a major data provider.
Zoobotanic	The foundation is involved in research,	The Zoobotanic Foundation will be a data

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Foundation of Rio Grande do Sul	teaching, botanic collection and seed bank.	provider and will benefit from SIBBr in terms of better access to data for research and teaching.
Cocoa Research Center	The Cocoa Research Center is engaged in research and maintains a herbarium of 114,000 specimens	The Research Center will be a data provider and will benefit from SIBBr in terms of better access to data for research.
Research programme in conservation and sustainable use of biodiversity of São Paulo State (Biota/Fapesp)	Biota/Fapesp coordinates São Paulo State's response to CBD. It is responsible for maintaining SinBiota (Environmental Biota Information System).	Biota/Fapesp will contribute to SIBBr in a number of ways. In addition to its role as a data provider it will inform the development of the information network and associated tools and applications. Biota/Fapesp will also benefit from SIBBr from improved data accessibility for planning and management.
Reference Centre for Environmental Information (CRIA)	CRIA's main aim is to contribute towards more sustainable use of Brazil's biodiversity through the dissemination of high quality information and education. It maintains information systems such as <i>speciesLink</i> (biological collections), SinBiota (observational data and inventories), SICol (Microbial Culture Collections), OBIS-Brazil (marine biogeography).	CRIA will play an important role in the project by developing key information systems (such as <i>speciesLink</i>) that will be part of the SIBBr network. It may also have a role in maintaining the system.
International Conservation NGOs	Several of the biggest international conservation NGOs have offices or affiliated institutions in Brazil. They work towards conserving biodiversity and promoting sustainable development. The three most important conservation NGOs for the SIBBr project are: <ul style="list-style-type: none"> • Conservation International (CI) – Brazil. Focused on biodiversity conservation in hotspots, corridors and large natural areas. • The Nature Conservancy (TNC) – Brazil. Mission to protect plants, animals and natural ecosystems. Conserves terrestrial and aquatic habitats. • WWF–Brazil. Dedicated to nature conservation with objectives of harmonizing human use with conservation. Promotes rational use of natural resources. 	International NGOs will benefit from SIBBr both as data providers and users. As data providers they will have a platform to share their data. As data users: <ul style="list-style-type: none"> • CI-Brazil will be better able to define hotspots and conservation corridors. • TNC-Brazil will be able to use SIBBr to evaluate the health of species and ecosystems to better fulfil their mission. • WWF-Brazil will benefit from better information to promote the harmonization of sustainable natural resource use and biodiversity conservation.
Private and Public Productive Sectors	Much of the productive sector in Brazil depends on intense use of natural resources which need to be managed in a sustainable fashion.	<u>The private sector a major beneficiary for better access to reliable information on biological diversity:</u> <ul style="list-style-type: none"> • <u>to aid in the environmental licensing process;</u> • <u>to help chose among economically viable project alternatives;</u> • <u>to orient best business practices;</u>

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		<ul style="list-style-type: none"> • <u>for those companies that utilize biodiversity directly, such as cosmetics, native-species forestry, and bioprospecting enterprises, enhanced access to biodiversity information can lead to enhanced new product development, as well as better in situ and ex situ resource management</u>