

**PROGRAMA DAS NAÇÕES UNIDAS PARA O DESENVOLVIMENTO - PNUD
RELATÓRIO DE ENTREGA DE PRODUTO**

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Guidelines for countries to provide a brief report on the state of their biodiversity for food and agriculture

Prepared by the Secretariat of the FAO Commission on Genetic Resources for Food and Agriculture

Introduction

The present guidelines are intended to assist countries that have not submitted a Country Report for *The State of the World's Biodiversity for Food and Agriculture* to prepare a brief report, capturing the major issues and findings on the state of their biodiversity for food and agriculture. The brief reports will be used at the informal regional consultations where countries will come together to discuss and define the regional needs and priorities for the conservation and sustainable use of biodiversity for food and agriculture.

The brief report is not meant to replace the Country Report which should follow the guidelines for the preparation of Country Reports (country report guidelines¹). It should, however, provide a solid basis for the preparation of such a Country Report. Countries that have not yet prepared a Country Report are requested to prepare the brief report for the informal regional consultations, and to make use of its information in the preparation of their Country Report.

Context

Conservation and sustainable management of biodiversity for food and agriculture require a comprehensive understanding of the state and use of its components. Biodiversity for food and agriculture includes the variety and variability of animals, plants and micro-organisms at the genetic, species and ecosystem levels that sustain the structure, functions and processes of agricultural, pastoral, forest and aquatic production systems. This diversity has been managed or influenced by farmers, livestock keepers, forest dwellers and fisherfolk for hundreds of generations and reflects the diversity of both human activities and natural processes.

In 2007, the Commission on Genetic Resources for Food and Agriculture (the Commission)² requested FAO to prepare the first report on *The State of the World's Biodiversity for Food and Agriculture* (Report). The presentation of a draft of the Report is foreseen for the Commission's Sixteenth Regular Session in the beginning of 2017.³

At its Fourteenth Regular Session, the Commission invited countries to participate in the process by preparing Country Reports on the state of their national biodiversity for food and agriculture.⁴ To assist countries in this task, FAO developed guidelines for the preparation of Country Reports (country report

¹ See <http://www.fao.org/nr/cgrfa/biodiversity/guidelines/en/>.

² The FAO Commission on Genetic Resources for Food and Agriculture is the only intergovernmental forum that specifically develops policies for the sustainable use and conservation of genetic resources for food and agriculture and the fair and equitable sharing of benefits derived from their use. As of 1 December 2015, 178 countries are member of the Commission.

³ CGRFA-11/07/Report, Appendix E.

⁴ CGRFA-14/13/Report, paragraph 14.

guidelines).⁵ Building on previous global assessments prepared under the aegis of the Commission, the Report will focus on the interactions between sectors (plant, animal, forest and aquatic genetic resources) and on cross-sectoral matters. It will also provide baseline information on the state of associated biodiversity⁶ and the ecosystem services they provide (please consult Appendix 1 for the scope of the Report).

Informal regional consultations

In accordance with a request of the Commission,⁷ a series of informal regional consultations will be held in 2016 as part of the preparation of the Report with National Focal Points appointed by countries. The objective of the informal consultations is to discuss needs and priorities for the conservation and sustainable use of biodiversity for food and agriculture in the region. To support discussions at the regional consultations, countries that have not submitted a Country Report are invited to use the present guidelines to prepare a brief report on the state of their biodiversity for food and agriculture.

Recommended approach for preparing a brief report on the state of the country's biodiversity for food and agriculture

Given the cross-sectoral nature of the brief report, National Focal Points are encouraged to involve as many representative stakeholders as practical, including government, research and civil society representatives from different sectors (fisheries and aquaculture, forest, livestock and plants) and those able to support analysis of associated biodiversity.

The National Focal Point is invited to submit the brief report to the Secretariat of the Commission by email at: SOW-BFA@fao.org in English, French or Spanish. To ensure the brief reports are taken into consideration during the discussions at the respective informal regional consultations, countries are requested to submit them no later than **XXX**.

To assist countries with the preparation of the brief report, the guidance presented below is organized around the following four priority areas of biodiversity for food and agriculture:

- I. Assessment and monitoring
- II. Conservation and sustainable use
- III. Policies, institutions and capacity
- IV. Regional and international cooperation

Countries are invited to provide information on the above mentioned priority areas, to identify areas where information is missing and to focus on their needs and priorities.⁸

⁵ See <http://www.fao.org/nr/cgrfa/biodiversity/guidelines/en/>.

⁶ Associated biodiversity includes a range of organisms that are found in and around production systems, above and below ground, and that have a functional role in the ecosystem, for example through pollination, soil formation, water provision, etc. For a more detailed definition, see Annex 1 of the country report guidelines.

⁷ CGRFA-15/15/Report, paragraph 13.

⁸ The Commission acknowledged that the Report's findings would be preliminary and incomplete in a number of areas and requested FAO to ensure that such information gaps would be assessed and highlighted in the report (CGRFA-14/13/Report, paragraph 15).

Proposed contents of the brief report

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STATE OF KNOWLEDGE OF BIODIVERSITY FOR FOOD AND AGRICULTURE

Please consult referenced sections of the country report guidelines⁹ for additional information, descriptions and definitions.

I. Assessment and monitoring of biodiversity for food and agriculture

1.1 General context¹⁰

a) Provide a brief account on the role of biodiversity for food and agriculture in your country.¹¹

- Brazil is one of the world's most mega-diverse country thanks to the extraordinary diversity of ecosystems and species existing within its borders. Brazil contains unique biological diversity and associated traditional ecological knowledge, that supports a large share of the world's food supply in a range of ecosystems that are global priorities for conservation. Due to the fact, that the biodiversity in Brazil is so vast, the use of these genetic resources is still scarcely explored, appreciated and conserved.
- Biodiversity is essential for agriculture. In a more general view, without it, pollination is affected, output falls with the poor quality of the soil, and the water becomes more polluted. In Brazil, several rating scales can demonstrate this importance. Both at the ecosystem level and at agroecosystems, the importance of biodiversity has been highlighted. Although much of it is unknown, microbial diversity and its activity in soil has been studied in Brazil, including in degraded areas. The soil diversity is strongly affected by the location/type of use, but natural vegetation areas have shown greater richness and abundance of species than areas with human influence, demonstrating the impact of usage on this system component. However, more diverse systems of production such as Agroforestry Systems (AFS) potentially offer higher environmental services than those simpler ones (monoculture), because it has different components and extracts, thus being more efficient at converting energy into biomass and into organic matter for the soil. Similarly, no-tillage systems or systems that do not use burning have presented carbon stocks superior to conventional ones, also showing the benefits on soil biodiversity that may be seen both in quantitative and functional terms. Meaning the reduction of microbial biomass of the soils and its efficiency (increased in CO₂) have been associated with reduction of carbon in the soil, but alterations in key functional genes of the nitrogen cycle (nitrification, denitrification, ammonification) has also been associated with changes in land use.

⁹ See <http://www.fao.org/nr/cgrfa/biodiversity/guidelines/en/>.

¹⁰ Reference: questions 2, 3, 4, 5, 6 and 7 of country report guidelines.

¹¹ Reference: question 3 of country report guidelines.

- b) Indicate which of the production systems listed in Table 1 below are found in your country¹² and briefly describe each of them (e.g. area under production, share of smallholders, importance of the production system to the incomes, livelihoods and well-being of rural communities, etc.).¹³

Table 1. Production systems present in the country.

Production system	Indicate if present in the country (Y/N)	Description ¹³
Livestock grassland-based systems	Y	<p>Traditional pasture: Cultivation of grasses (Jaragua, brachiarias) with low supply of inputs and/or investments. Low animal productivity.</p> <p>Improved pasture: Cultivation of improved grasses (Brachiaria and other species) with rational allocation of inputs (animal and plant genetics, correction and mineral or organic fertilization of the soil) and/or investments (conservation practices), rotational grazing. Good animal productivity</p>
Livestock landless systems	Y	It is an intensive system of production, used for the breeding of pigs, poultry (chicken or turkey) and fishes.
Naturally regenerated forests	Y	The natural regeneration of forests has been verified in Brazil, mainly in the Amazon and Atlantic Rainforest Biomes. The Forest Remnants Atlas of the Atlantic Rainforest, which monitors the spatial distribution of the biome, identified regeneration of 2,197 km ² between 1985 and 2015 in nine of the 17 states of the biome. The TerraClass Project of Amazon has identified the regeneration of 173,387 km ² in the Amazon until the year 2014. However, since regeneration occurs also in public areas, most of these areas are not used for productive purposes. As Brazil still has large tracts of forested areas, the importance of regenerated areas as a source of income and livelihood is very small. But when it occurs is with a rational use and/or selective cutting
Planted forests	Y	Forest of exotic or native species. For exotic species, it is generally established by clonal material for production of paper and cellulose. For native species, it is generally established with a non genetically improved material for timber products.

¹² Reference: questions 4 and 5 of country report guidelines. For the purpose of this table, aggregated production systems are used (disregarding climatic zones).

¹³ Reference: questions 5 and 7 (Table 3) of country report guidelines and FAOSTAT: <http://faostat3.fao.org/home/E>

Self-recruiting capture fisheries	Y	The most prominent example is with the native specie <i>Arapaima gigas</i> (common name pirarucu) in the Amazon river basin region. Other systems have been tested with small characins (<i>Astyanax</i> genus) and other exotic species in reservoirs.
Culture-based fisheries	Y	Very common practice in Brazilian reservoirs done by State governments. This is carried out with native and exotic species.
Fed aquaculture	Y	Exotic and native fishes. E.g., tilapia (<i>Oreochromis niloticus</i>), tambaqui (<i>Colossoma macropomum</i>), pintado (<i>Pseudoplatystoma corruscans</i>).
Non-fed aquaculture	Y	Very common practice in Brazilian reservoirs and small/medium farms which livestock is the main activity. The byproducts (wastes) from livestock (e.g., swine) are recycled to become input for aquaculture species.
Irrigated crops (rice)	Y	The irrigation development in the South has focused mainly on summer flooding of lowlands for rice production (Rio Grande do Sul). Most of this is large-scale and mechanized, and is closely integrated with cattle production, largely for reasons of weed control.
Irrigated crops (other)	Y	No information
Rainfed crops	Y	Grains and Fibers planted under the conventional system: Production of grains and fibers (soybean, corn, rice, cotton) in annual monocultures, with intensive tillage, high input of chemical fertilizers and phytosanitary products. Grains and Fibers planted under No-Tillage System: Production of grains and fibers (soybean, corn, rice, cotton) without tillage, and with rotation and intercropping of crops and rational use of inputs, integrated management of pests and diseases and traffic control, meeting the basic premises of the No-Tillage System
Mixed systems (livestock, crop, forest and/or aquatic and fisheries)	Y	Crop-Pasture: Production of crops (soybean, corn, rice, cotton), in rotation with pasture, without tillage, and with rational use of inputs, integrated management of pests and disease and control of traffic (No-Tillage Crop - Livestock Integration, meeting the basic premises of the No-Tillage System). Crop-Pasture-Forest Integration: Production of crops (soybean, corn, rice, cotton), pasture and forest (<i>Eucalyptus</i> and/or other species), intercropped and integrated, without tillage,

		and with rational use of inputs, integrated management of pests and diseases and traffic control. (Crop-Livestock-Forest Integration), meeting the basic premises of the No-Tillage System
Others (please specify)	Mixed forests	Ecological intensification of cultivation of Eucalyptus with nitrogen-fixing tree species
	Organic systems	Production system that adopts specific techniques, optimizing the use of available natural and socio-economic resources and respect for the cultural integrity of rural communities, aiming at economic and ecological sustainability, maximizing social benefits, minimizing energy dependence where possible, cultural, biological and mechanical methods, as opposed to the use of synthetic materials, the elimination of the use of genetically modified organisms and ionizing radiation at any stage of the production, processing, storage, distribution and marketing process , and the protection of the environment.
	Extractive systems	Management and harvesting of non-timber products of native species usually carried out by traditional populations.

1.2. State, trends and drivers of change of biodiversity for food and agriculture

- a) Describe the main features of the state and trends¹⁴ of and the main drivers of change¹⁵ affecting plant, animal, forest and aquatic genetic resources in the country's production systems as identified in Table 1.
- Livestock grassland-based systems: the main factor that leads to the degradation of plant and animal genetic resources is the change of land and water use and management caused by large-scale agriculture, with the use of few species, most of them being alien species. Others drivers of change are over-exploitation, climate change, pests, diseases, alien invasive species, population growth and urbanization.
 - Livestock landless systems: advancements and innovations in science and technology; external inputs; diseases; markets and trade.
 - Naturally regenerated forests: policies (Law 12.651/2012); population growth and

¹⁴ Reference: (i) the First and Second Reports on the *State of the World's Plant Genetic Resources for Food and Agriculture*; the First and Second Reports on the *State of the World's Animal Genetic Resources for Food and Agriculture*; and *The State of the World's Forest Genetic Resources*; and (ii) questions 3, 11, and 20 of country report guidelines.

¹⁵ Reference: (i) the First and Second Reports on the *State of the World's Plant Genetic Resources for Food and Agriculture*; the First and Second Reports on the *State of the World's Animal Genetic Resources for Food and Agriculture*; and *The State of the World's Forest Genetic Resources*; (ii) Annex 3 of the country report guidelines includes a list of drivers of change and descriptions; and (iii) questions 44, 45 and 55 of country report guidelines.

urbanization; changing economic, socio-political, and cultural factors; changes in land and water use and management; over-exploitation and overharvesting; climate change.

- Planted forests: changes in land and water use and management; pests, diseases, alien invasive species; climate change; markets, trade and the private sector; policies.
- Self-recruiting capture fisheries: over-exploitation and overharvesting; policies; changing economic, socio-political, and cultural factors.
- Culture-based fisheries: Climate change; Changes in land and water use and management; Markets, trade and the private sector.
- Fed aquaculture: Climate change; Pollution and external inputs; Markets, trade and the private sector; Policies; Changing economic, socio-political, and cultural factors.
- Non-fed aquaculture: Climate change; Changes in land and water use and management; Pollution and external inputs; pests, diseases, alien invasive species; markets, trade and the private sector; policies.
- Irrigated crops (rice): Changes in land and water use and management; Pollution and external inputs; Climate change; Policies; Markets, trade and the private sector; Population growth and urbanization;
- Irrigated crops (other): Changes in land and water use and management; Pollution and external inputs; Climate change; Policies; Markets, trade and the private sector; Population growth and urbanization;
- Rainfed crops: Climate change; Changes in land and water use and management; Pollution and external inputs; Pests, diseases, alien invasive species; Markets, trade and the private sector; Policies; Population growth and urbanization; Changing economic, socio-political, and cultural factors; Advancements and innovations in science and technology
- Mixed systems (livestock, crop, forest and/or aquatic and fisheries): Changes in land and water use and management; Climate change; Markets, trade and the private sector; Policies; Advancements and innovations in science and technology; Changing economic, socio-political, and cultural factors.
- Mixed forests (others): Changes in land and water use and management; Climate change; Markets, trade and the private sector; Policies; Advancements and innovations in science and technology; Changing economic, socio-political, and cultural factors.

b) Indicate whether the country has any national information system in place on associated

biodiversity and identify the most frequently monitored components of associated biodiversity.¹⁶

- MAPA has Agrofit that lists the target pests (microorganisms, arthropods and pests, diseases, and weeds) and the biological control organisms that are registered in the system (http://agrofit.agricultura.gov.br/agrofit_cons/principal_agrofit_cons).
- SIBBr will host the Biodiversity Nutrition Composition Database (<http://www.sibbr.gov.br/areas/index.php?area=uso&subarea=alimentacao-e-nutricao>) and contains the tool "Species Sheet" (<https://ferramentas.sibbr.gov.br/ficha/bin/view/especie/>) with information on taxonomy, natural history, distribution, ecological importance and state of conservation of Brazilian species accompanied by records and images.
- Alelo Embrapa. Portal for services and management of data and information on Genetic Resources in Brazil, maintained by Embrapa – Brazilian Company of Agricultural Research. Contains passport data, statistics, characterization and evaluation of materials kept in germplasm banks. (<http://alelobag.cenargen.embrapa.br/AleloConsultas/Conservacao/capacidade.do>).
- The Ministry of the Environment maintains the Research Network on Pollination and Sustainable Management of Pollinators - POLINFRUT, as part of the research, teaching and extension activities developed by the Network in the municipalities of Ibicoara and Mucugê, Bahia, within the scope of the project "Conservation and Management of Pollinators for Sustainable Agriculture through the Ecosystem Approach "(FAO / GEF / UNEP / FUNBIO). This project is supported by the Global Environment Facility (GEF) and is implemented in seven countries: Brazil, South Africa, India, Pakistan, Nepal, Ghana and Kenya. The project is coordinated at the global level by the United Nations Food and Agriculture Organization (FAO), with support from the United Nations Environment Program (UNEP). In Brazil, it is coordinated by the Ministry of the Environment (MMA), with support from the Brazilian Biodiversity Fund (FUNBIO).

c) List associated biodiversity species that are actively managed in production systems for the provision of ecosystem services in Table 2.

Table 2. List of associated biodiversity species that are actively managed in production systems for the provision of ecosystem services.¹⁷

Ecosystem functions and services provided by the species in the production system	Associated biodiversity species
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¹⁶Reference: questions 28 and 75 of country report guidelines.

¹⁷Reference: question 27 of country report guidelines.

Soil formation and protection; nutrient cycling; water cycling; habitat provisioning; production of oxygen/ gas regulation	<i>Avena</i> spp.; <i>Cajanus cajan</i> ; <i>Canavalia ensiformis</i> ; <i>Cicer arietinum</i> ; <i>Crotalaria</i> spp.; <i>Dolichos lablab</i> ; <i>Glycine max</i> ; <i>Helianthus annuus</i> ; <i>Lathyrus sativus</i> ; <i>Leucaena leucocephala</i> ; <i>Lolium multiflorum</i> ; <i>Lupinus</i> spp.; <i>Mucuna</i> spp.; <i>Pennisetum glaucum</i> ; <i>Pisum sativum</i> ; <i>Prosopis juliflora</i> ; <i>Raphanus sativus</i> ; <i>Secale cereale</i> ; <i>Sorghum</i> spp.; <i>Tithonia diversifolia</i> ; <i>Triticum aestivum</i> ; <i>Vicia sativa</i> ; <i>Vigna</i> spp.; <i>Vigna angularis</i> ; <i>Vigna unguiculata</i> ; <i>Zea mays</i>
Natural hazard regulation	<i>Desmodium</i> spp.; <i>Arachis</i> spp. (natural fire control and containment of slopes); <i>Cymbopogon</i> spp., <i>Chrysopogon zizanioides</i> (erosion control)
Nutrient cycling (microorganism)	<i>Azorhizobium</i> spp; <i>Azospirillum brasilense</i> ; <i>Bacillus subtilis</i> ; <i>Bradyrhizobium</i> spp.; <i>Frauteria aurantia</i> ; <i>Mesorhizobium</i> spp.; <i>Rhizobium</i> spp.; <i>Sinorhizobium</i> spp.
Pastures for pollinators	<i>Anacardium occidentale</i> ; <i>Myracrodruon urundeuva</i> ; <i>Spondias tuberosa</i> ; <i>Copernicia prunifera</i> ; <i>Handroanthus impetiginosus</i> ; <i>Cochlospermum vitifolium</i> ; <i>Cordia oncocalyx</i> ; <i>Commiphora leptophloeos</i> ; <i>Cynophalla flexuosa</i> ; <i>Crateva tapia</i> ; <i>Combretum leprosum</i> ; <i>Cnidocolus quercifolius</i> ; <i>Croton sonderianus</i> ; <i>Libidibia ferrea</i> ; <i>Poincianella bracteosa</i> ; <i>Senna macranthera</i> ; <i>Anadenanthera colubrina</i> ; <i>Pityrocarpa moniliformis</i> ; <i>Mimosa arenosa</i> ; <i>Mimosa caesalpinifolia</i> ; <i>Mimosa tenuiflora</i> ; <i>Mimosa scabrella</i> ; <i>Senegalia polyphylla</i> ; <i>Amburana cearensis</i> ; <i>Ziziphus joazeiro</i> ; <i>Solanum paniculatum</i> ; <i>Hyptis suaveolens</i> ; <i>Lantana camara</i> ; <i>Ipomoea</i> spp. <i>Stylosanthes</i> spp.; <i>Chamaecrista</i> spp.; <i>Mimosa</i> spp.

Pest and disease regulation	<p><u>Plants:</u> <i>Salvia officinalis</i>; <i>Rosmarinus officinalis</i>; <i>Tanacetum vulgare</i>; <i>Tagetes</i> spp.; <i>Calendula officinalis</i>; <i>Coriandrum sativum</i>; <i>Chrysanthemum cinerariaefolium</i>; <i>Nicotiana tabacum</i>; <i>Derris</i> spp., <i>Lonchocarpus</i> spp.; <i>Tephrosia</i> spp.; <i>Azadirachta indica</i>; <i>Cymbopogon</i> spp.; <i>Pinus</i> spp.; <i>Eugenia caryophyllata</i>; <i>Mentha piperita</i>; <i>Piper nigrum</i>; <i>Allium</i> spp.; <i>Chenopodium ambrosioides</i>; <i>Ageratum conyzoides</i></p> <p><u>Animals:</u> <i>Celeus torquatus</i>; <i>Taeniotriccus Andrei</i>; <i>Empidonax</i> spp.; <i>Ortalis</i> spp.; amphibians (frogs), reptiles (lizards) and hens.</p> <p><u>Microorganisms:</u> <i>Diachasmimorpha longicaudata</i>; <i>Beauveria bassiana</i>; <i>Opius</i> spp.; <i>Neoseiulus idaeus</i>; <i>Bacillus thuringiensis</i>; <i>Apanteles flavipes</i> <i>Metagonistylum minense</i> <i>Paratheresia claripalpis</i> <i>Trichogramma</i> spp.; <i>Aphelinus</i> sp.; <i>Aphidius</i> sp.; <i>Praon</i> sp.; <i>Ephedrus</i> sp.; <i>Lysiphlebus</i> sp.; <i>Trissolcus basalis</i>; <i>Spalangia endius</i>; <i>Muscidifurax raptor</i>; <i>Ibalia leucospoides</i>; <i>Deladenus siricidicola</i>; <i>Aschersonia</i> sp.; <i>Aspergillus</i> spp.; <i>Beauveria</i> spp.; <i>Enthomophthora</i> sp.; <i>Erynia</i> sp.; <i>Hirsutella</i> sp.; <i>Metarhizium</i> spp.; <i>Nomurea</i> sp.; <i>Penicillium</i> spp.; <i>Hirsutella thompsonii</i></p>
Pollination	<p><i>Apis mellifera</i>, <i>Bombus morio</i>; <i>Centris aenea</i>; <i>Epicharis flava</i>; <i>Eulaema</i>; <i>Melipona quadrifasciata nigrita</i>; <i>Melipona scutellaris</i>; <i>Nannotrigona testaceicornis</i>; <i>Tetragonisca angustula</i>; <i>Trigona spinipes</i>; <i>Xylocopa frontalis</i>; <i>Xylocopa grisescens</i></p>
Recovery of degraded ecosystems (pastures, riparian forest, legal reserve area)	<p><i>Arachis</i> spp.; <i>Calopogonium</i> spp.; <i>Centrosema</i> spp.; <i>Desmodium</i> spp.; <i>Dipteryx alata</i>; <i>Genipa americana</i>; <i>Handraonthus</i> spp.; <i>Hymenaea</i> spp.; <i>Paspalum</i> spp.; <i>Psidium</i> spp.; <i>Stylosanthes</i> spp.; <i>Urochloa</i> spp.; <i>Tabebuia aurea</i>; <i>Eugenia</i> spp.; <i>Opuntia elata</i>; <i>Passiflora</i> spp.; <i>Schinus terebinthifolius</i>; <i>Araucaria angustifolia</i>; <i>Aspidosperma polyneuron</i>; <i>Balfourodendron riedelianum</i>; <i>Cedrela fissilis</i>; <i>Colubrina glandulosa</i>; <i>Enterolobium contortisiliquum</i>; <i>Miconia cinnamomifolia</i>; <i>Mimosa scabrella</i>; <i>Nectandra lanceolata</i>; <i>Parapiptadenia rigida</i>; <i>Piptocarpha angustifolia</i>; <i>Vernonanthura discolor</i>; <i>Bauhinia forficata</i>; <i>Cecropia glaziovii</i>; <i>Croton celtidifolius</i>; <i>Jacaranda</i> spp.; <i>Syagrus</i> spp.</p>

Water purification and waste treatment	<i>Moringa oleifera</i> ; <i>Limnocharis flava</i> ; <i>Echinodorus</i> spp.; <i>Equisetum arvense</i> ; <i>Typha domingensis</i> ; <i>Salvinia molesta</i> ; <i>Eichhornia crassipes</i> ; <i>Victoria amazonica</i> ; <i>Aponogeton</i> <i>crispus</i> ; <i>Eleocharis calva</i> ; <i>Cyperus</i> spp. <i>Pistia stratiotes</i>
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- d) Provide in Table 3 a list of wild food species known to be harvested, hunted, captured or gathered for food in your country. Indicate the change in state of the species over the last 10 years (strongly increasing (2), increasing (1), stable (0), decreasing (-1), or strongly decreasing (-2), or not known (NK)).

Table 3. Wild food species used for food in the country.¹⁸

Species (local name)	Species (scientific name)	Change in state (2,1,0,-1,-2, NK)
Animals		
Ananái	<i>Amazonetta brasiliensis</i>	NK
Capivara	<i>Hydrochoerus hydrochaeris</i>	NK
Cateto	<i>Pecari tajacu</i>	NK
Codorna	<i>Nothura</i> spp.	NK
Cotias	<i>Dasyprocta</i> spp.	NK
Ema	<i>Rhea americana</i>	NK
Iguana	<i>Iguana iguana</i>	NK
Inhambu	<i>Crypturellus</i> spp.	NK
Jabuti	<i>Chelonoidis</i> spp.	NK
Jacaré	<i>Caiman</i> spp. e <i>Melanosuchus niger</i>	NK
Jacupemba	<i>Penelope superciliaris</i>	NK
Jacutinga	<i>Pipile jacutinga</i>	NK
Macuco	<i>Tinamous</i> spp.	NK
Marrecos	<i>Dendrocygna</i> spp.	NK
Mocó	<i>Kerodon</i> spp.	NK
Muçuã	<i>Kinosternon scorpioides</i>	NK
Mutum	<i>Crax fasciolata</i>	NK
Paca	<i>Cuniculus paca</i>	NK
Paturi	<i>Netta erythrophthalma</i>	NK
Perdiz	<i>Rhynchotus rufescens</i>	NK
Queixada	<i>Tayassu pecari</i>	NK
Rã-Manteiga	<i>Leptodactylus ocellatus</i>	NK
Tatus	Dasypodidae	NK
Tartarugas	<i>Podocnemis</i> spp. e <i>Kinosternon scorpioides</i>	NK

¹⁸ Reference: question 34 of country report guidelines.
Espécies cinergeticas brasileiras

Teiú	<i>Tupinambis spp.</i>	NK
Tracajá	<i>Podocnemis unifilis</i>	NK
Veados	<i>Mazama spp.</i>	NK
Veado-Campeiro	<i>Ozotoceros bezoarticus</i>	NK
Plants		
Abiu	<i>Pouteria caimito</i>	NK
Açaí	<i>Euterpe oleracea, E. precatoria</i>	2
Araticum	<i>Annona crassiflora</i>	1
Araçá	<i>Psidium cattleianum; P. guineense</i>	0
Araçá-Boi	<i>Eugenia stipitata</i>	1
Araça-Pêra	<i>Psidium acutangulum</i>	NK
Ariá	<i>Goepertia allouia</i>	NK
Aroeira-Pimenteira	<i>Schinus terebinthifolius</i>	2
Arumbeva	<i>Opuntia dillenii, O. elata, O. monacantha</i>	0
Babaçu	<i>Attalea speciosa</i>	-1
Bacaba	<i>Oenocarpus bacaba, O. distichus</i>	0
Bacuri	<i>Platonia insignis</i>	1
Baru	<i>Dipteryx alata</i>	2
Batata-mairá	<i>Casimirella rupestris</i>	NK
Beldroega	<i>Portulaca oleracea</i>	1
Biribá	<i>Annona mucosa</i>	0
Buriti	<i>Mauritia flexuosa</i>	1
Butiá	<i>Butia catarinensis, B. eriospatha</i>	1
Cacau-carambola	<i>Herrania mariaae</i>	NK
Cacauí	<i>Theobroma speciosum, T. sylvestre</i>	0
Cagaita	<i>Eugenia dysenterica</i>	1
Cajá	<i>Spondias monbim</i>	2
Cajú-do-Cerrado	<i>Anacardium corymbosum, A. humile, A. nanum</i>	0
Camu-Camu	<i>Myrciaria dubia</i>	2
Cambui	<i>Myrciaria floribunda</i>	0
Cará	<i>Dioscorea altissima; D. trifida</i>	2
Castanha do Brasil	<i>Bertholletia excelsa</i>	2
Cereja	<i>Eugenia involucrata</i>	0
Chichá	<i>Sterculia striata</i>	0
Chicória-do-pará	<i>Eryngium foetidum</i>	1
Coquinho-Azedo	<i>Butia capitata</i>	1
Crem	<i>Tropaeolum pentaphyllum</i>	0
Croá	<i>Sicana odorifera</i>	1
Cubiu	<i>Solanum sessiliflorum</i>	2
Cupuaçu	<i>Theobroma grandiflorum</i>	2
Dendê	<i>Elaeis oleifera</i>	1
Erva Mate	<i>Ilex paraguariensis</i>	2
Fisalis	<i>Physalis pubescens</i>	2
Goiaba-Serrana	<i>Acca sellowiana</i>	0
Guabiroba	<i>Campomanesia xanthocarpa</i>	0

Guabiroba	<i>Campomanesia adamantium</i>	0
Gueroba	<i>Syagrus oleracea</i>	2
Inajá	<i>Maximiliana maripa</i>	0
Jabuticaba	<i>Plinia cauliflora</i> , <i>P. peruviana</i>	1
Jaracatiá	<i>Jacaratia spinose</i> , <i>Vasconcellea quercifolia</i>	0
Jatobá	<i>Hymenaea courbaril</i> , <i>H. stigonocarpa</i>	1
Jenipapo	<i>Genipa americana</i>	0
Juçara	<i>Euterpe edulis</i>	1
Jurubeba	<i>Solanum paniculatum</i>	0
Licuri	<i>Syagrus coronata</i>	0
Macaúba	<i>Acrocomia aculeata</i>	0
Major-Gomes	<i>Talinum paniculatum</i> , <i>T. triangulare</i>	1
Mandacaru	<i>Cereus jamacaru</i>	0
Mangaba	<i>Hancornia speciosa</i>	1
Mangarito	<i>Xanthosoma riedelianum</i>	1
Maracujá	<i>Passiflora actinia</i> , <i>P. alata</i> , <i>P. cincinnata</i> , <i>P. nitida</i> , <i>P. quadrangularis</i> , <i>P. setacea</i>	2
Mini-Pepininho	<i>Melothria pendula</i>	NK
Mocambo	<i>Theobroma bicolor</i>	NK
Mureré	<i>Limnocharis flava</i>	NK
Murici	<i>Byrsonima crassifolia</i> , <i>B. verbascifolia</i>	1
Ora-Pro-Nobis	<i>Pereskia aculeata</i>	1
Pacurina	<i>Pacourina edulis</i>	NK
Patauá	<i>Oenocarpus bataua</i>	NK
Pequi	<i>Caryocar brasiliense</i> , <i>C. coryaceum</i>	2
Pera-do-Cerrado	<i>Eugenia klotzschiana</i>	0
Pimenta	<i>Capsicum</i> spp.	2
Pinhão	<i>Araucaria angustifolia</i>	1
Pitanga	<i>Eugenia uniflora</i>	2
Pupunha	<i>Bactris gasipaes</i>	1
Sapota	<i>Matisia cordata</i>	NK
Taioba	<i>Xanthosoma taioba</i>	2
Tucumã	<i>Astrocaryum aculeatum</i>	0
Umari	<i>Poraqueiba sericea</i>	NK
Umbu	<i>Spondias tuberosa</i>	1
Urucum	<i>Bixa orellana</i>	1
Uvaia	<i>Eugenia pyriformis</i>	0
Uxi	<i>Endopleura uchi</i>	0
Vitória-regia	<i>Victoria amazonica</i>	NK

e) If available, provide information on the proportion of the population in your country that uses wild

food on a regular basis for food and nutrition.¹⁹

- In Brazil, there are no official data on the percentage of the population that regularly consumes native (Wild) species in their diet. It is a matter of great complexity and, for a realistic analysis, needs to consider the ethnic and environmental diversity and the economic aspects that forms the population of Brazil. However, based on the observations of the alimentation habits in the different regions of the country, it is possible to infer that native species are part of the diet of a very expressive contingent of the Brazilian population although the species used (plants and animals) and the intensity of the use may vary by region.
- In the case of plants, there are species of restricted regional use, such as the pequi (*Caryocar brasiliensis*) and the gueroba (*Syagrus oleracea*) that are part of the daily diet of the central-west region of Brazil; the chicória (*Eryngium foetidum*) and the cupuaçu (*Theobroma grandiflorum*) are frequently consumed in the Northern Region; the umbu is more consumed in the Northeast; the mangarito, the taioba and the ora-pro-nobis are part of important dishes of the Southeast region cuisine.
- On the other hand, species such as açai (*Euterpe oleracea*), pupunha (*Bactris gasipaes*), cará (*Dioscorea spp.*) and taioba (*Xanthosoma taioba*) are part of the daily diet, especially of the urban population, in all regions of the contry and are easily found in street markets and supermarkets.
- In the specific case of the use of wild animals on diet the situation is more complex and, possibly, the number of people who regularly eat those animals is small, restricted only to indigenous peoples and some traditional communities. Brazil has a high diversity of wild animals, however, much of it is threatened with extinction, mainly, due to deforestation, habitat fragmentation and hunting pressure. Those processes act synergistically and lead to an accelerated extinction process of native fauna. Hunting is prohibited in the country, although there are some movements pressing the federal government for its legalization in special situations. According to Machado et al. (2013) (Revista Agroambiental vol. 5) the products from hunting are mostly destined to family feeding, without involving commercialization and presents very distinct regional characteristics. There is a preference for cervids, tapirs, agouti, pacas, wild pigs, armadillos, monkeys, coatis, jacus, partridges and turtles.

f) Briefly summarize the state and trends²⁰ of and the drivers of change²¹ affecting:

- Associated biodiversity²²: micro-organisms, invertebrates, vertebrates, plants:

Climate change; Changes in land and water use and management; Pollution and external inputs; Pests, diseases, alien invasive species; Policies; Advancements and innovations in science and technology

¹⁹ Reference: question 59 of country report guidelines.

²⁰ Reference: questions 21, 22, 23, 24, 29, 34 and 35 of country report guidelines.

²¹ Reference: Annex 3 and questions 9, 10, 12, 14, 44, 45 and 55 of country report guidelines.

²² Annex 1 of the country report guidelines provides a definition of associated biodiversity.

- Ecosystem services²³: regulating, supporting:

Climate change; Changes in land and water use and management; Pollution and external inputs; Pests, diseases, alien invasive species; Markets, trade and the private sector; Policies; Changing economic, socio-political, and cultural factors; Advancements and innovations in science and technology

- Wild food resources²⁴:

Climate change; Changes in land and water use and management; Pollution and external inputs; Pests, diseases, alien invasive species; Markets, trade and the private sector; Policies; Population growth and urbanization; Overexploitation; Changing economic, socio-political, and cultural factors; Advancements and innovations in science and technology.

BOX 1. Describe one or two examples of countermeasures that have been taken in the country to reduce adverse effects of drivers on associated biodiversity, ecosystem services and/or wild foods.²⁵

- Adoption of the No-Tillage System, of the Crop-Livestock-Forest Integration System and of technologies for better use and for management of lands.
- The series Notebooks from Family Farming (<http://www.mda.gov.br/sitemda/publica%C3%A7%C3%B5es-s%C3%A9rie-cadernos-da-agricultura-familiar>) by the Special Secretariat for Family Agriculture and Agrarian Development (SEAD) aimed at promoting the sustainable use of biodiversity in agroecological production.
- The Ministry of Agriculture, in partnership with the Ministry of Environment, published a series of nine booklets on best practices for the collection of wild foods with guidelines for the improved use of biodiversity. The booklets have the potential of promoting organic certification for wild foods that are sustainably collected. They present practical tools and information for collectors, associations, cooperatives and capacity building professionals. The series is being expanded in 2017 for 21 new species.
- The GEF Pollinators Project, during its execution, contributed to disseminate the following pollinator friendly practices include: a) to recover Areas of Permanent Preservation and Legal Reserve²⁶ with attractive plants to pollinators; b) to keep attractive plants in the vicinity of plantations as well as trap-nests for nesting bees (landscape design and enrichment); c) do not apply pesticide during the flowering season, neither immediately before the flourishing or when pollinators are visiting the crop; d) do not destroy nests and sites for nesting/reproduction of pollinators; e) distribute rational bee nests in the vicinity of plantations; f) to keep attractive plants at gardens, zoos and public squares; f) to keep attractive plants at lanes parallel to highways.

1.3 Needs and priorities

²³ Annex 4 of the country report guidelines provides a definition of ecosystem services.

²⁴ Reference: question 34 of country report guidelines.

²⁵ Reference: question 19 of country report guidelines.

²⁶ Areas of Permanent Preservation and Legal Reserve are legal requirements in the Law n. 12.651/ 2012, available on http://www.planalto.gov.br/ccivil_03/_ato2011-2014/2012/lei/l12651.htm; access on 15th May 2017.

- a) Identify the country's main needs and priorities in terms of the state of biodiversity for food and agriculture, and in particular of associated biodiversity, wild foods and ecosystem services.²⁷
- Carry out a comprehensive study to diagnose the percentage of the Brazilian population that makes use of biodiversity in food and nutrition, as well as to map the main bottlenecks that prevent the expansion of this use;
 - The impacts of changes in land use on ecosystem services;
 - There is limited availability of laboratory technicians to support research on the topic;
 - There are few social scientists to work with natural scientists in solving the problems caused by misuse, misplanning and mismanagement of agricultural lands in the country;
 -
 - Carry out studies on the conservation (in situ and ex situ) of the genetic resources of the biodiversity species, mainly of the native fauna and flora of Brazil, in order to avoid that the indiscriminate use raises the risk of extinction of the species.
 - There are not specific policies, and institutions are not prepared to inter-disciplinary work, which is a requirement for achieving the desired goals.
 - Increase research on the genetic improvement of wild food species aiming greater productivity and greater knowledge of its genetic structure

II. Sustainable use and conservation of biodiversity for food and agriculture

2.1 Sustainable use

- a) List in Table 4 management and diversity based practices that support the maintenance and use of biodiversity for food and agriculture in production systems [strongly increasing (2), increasing (1), stable (0), decreasing (-1), or strongly decreasing (-2), or not known (NK)].

Table 4. Management²⁸ and diversity based²⁹ practices that support the maintenance and use of biodiversity for food and agriculture in production systems.

Production system	Management/ diversity based practice ³⁰	Trends in the application of the practice over the past ten years
Rainfed crops	Grains and Fibers planted under No-Tillage System: Production of grains and fibers (soybean, corn, rice, cotton) without tillage, and with rotation and intercropping of crops and rational use of inputs, integrated management of pests and diseases and traffic control, meeting the basic premises of the No-Tillage System	2

²⁷ Reference: questions 28, 48 and 49 of country report guidelines.

²⁸ Annex 5 of the country report guidelines describes a list of management practices supporting the use and conservation of biodiversity for food and agriculture.

²⁹ Annex 6 of the country report guidelines describes a list of diversity based interventions supporting the use and conservation of biodiversity for food and agriculture.

³⁰ Reference: questions 52, 53 and 56 of country report guidelines.

<p>Mixed systems (livestock, crop, forest and/or aquatic and fisheries)</p>	<p>Crop-Pasture: Production of crops (soybean, corn, rice, cotton), in rotation with pasture, without tillage, and with rational use of inputs, integrated management of pests and disease and control of traffic (Crop(No-Tillage)-Livestock Integration, meeting the basic premises of the No-Tillage System).</p> <p>Crop-Pasture-Forest Integration: Production of crops (soybean, corn, rice, cotton), pasture and forest (Eucalyptus and/or other species), intercropped and integrated, without tillage, and with rational use of inputs, integrated management of pests and diseases and traffic control. (Crop-Livestock-Forest Integration), meeting the basic premises of the No-Tillage System</p>	<p>2</p>
<p>Livestock grassland-based systems</p>	<p>Improved pasture: Cultivation of improved grasses (Brachiaria and other species) with rational allocation of inputs (animal and plant genetics, correction and mineral or organic fertilization of the soil) and/or investments (conservation practices) rotational grazing Good animal productivity</p>	<p>1</p>
<p>Naturally regenerated forests</p>	<p>The natural regeneration of forests has been verified in Brazil, mainly in the Amazon and Atlantic Rainforest Biomes. The Forest Remnants Atlas of the Atlantic Rainforest, which monitors the spatial distribution of the biome, identified regeneration of 2,197 km² between 1985 and 2015 in nine of the 17 states of the biome. The TerraClass Project of Amazon has identified the regeneration of 173,387 km² in the Amazon until the year 2014. However, since regeneration occurs also in public areas, most of these areas are not used for productive purposes. As Brazil still has large tracts of forested areas, the importance of regenerated areas as a source of income and livelihood is very small. But when it occurs is with a rational use and/or selective cutting.</p>	<p>0</p>

Extractive systems	The management and harvesting of an adequate percentage of the fruits of a species in its place of origin allows its ecological cycle to continue in development, thus allowing the birth of new plants and the perpetuation of the species in its natural environment, together with the associated biodiversity	-1
Organic systems	The use of natural fertilizers and the incorporation of organic matter into the soil allows a significant increase of microorganisms and earthworms in the soil, reducing their acidity, providing immobilized nutrients, reducing water loss and increasing productivity.	1

BOX 2. Describe a successful programme or project that has been undertaken in the country to support one of the practices listed in Table 4.³¹

- Programa ABC (Low Carbon Agriculture Program) – Actions to be taken to adopt the sustainable production technologies selected to meet the commitments to reduce greenhouse gas emissions.

The Sectoral Plan for Mitigation and Adaptation to Climate Change for the Consolidation of a Low Carbon Economy Economy - ABC is one of the sectoral plans elaborated in accordance with article 3 of Decree No. 7,390 /2010 and the organization and planning of the actions to be taken to adopt the sustainable production technologies selected to meet GHG emission reduction commitments in the agricultural sector assumed by the country.

The ABC Plan is composed of seven programs, six of which are related to mitigation technologies, and one last program with actions to adapt to climate change:

- Program 1: Recovery of Degraded Pastures;
- Program 2: Integration of Livestock-Livestock-Forest (iLPF) and Agroforestry Systems (SAFs);
- Program 3: Direct Planting System (SPD);
- Program 4: Biological Fixation of Nitrogen (BNF);
- Program 5: Planted Forests;
- Program 6: Treatment of Animal Waste;
- Program 7: Adapting to Climate Change.

The scope of the ABC Plan is national and its period of validity is from 2010 to 2020, and revisions and updates are planned in regular periods not exceeding two years ago, to re-adjust it to the demands of society, new technologies and incorporate new actions and goals, if necessary.

³¹ Reference: question 54 of country report guidelines.

To reach the objectives outlined by the ABC Plan, in the period between 2011 and 2020, it is estimated that resources of the order of R\$ 197 billion will be required, financed with budgetary sources or through credit lines.

The ABC Plan should be understood as the instrument for integrating the actions of governments (federal, state and municipal), the productive sector and civil society, to reduce emissions of greenhouse gases (GHG) from agricultural, forestry activities and livestock. For its effectiveness an institutional arrangement will be established that involves the representations of the various entities involved. The participation of civil society is essential and reaffirms the democratic character in the design and implementation of the programs envisaged.

The ABC Plan has a credit line - ABC Program - approved by BACEN Resolution No. 3.896 of 08/17/10.

- b) Provide examples whereby the diversity *per se*,³² or its lack,³³ had a direct effect on productivity; food security and nutrition; rural livelihoods; ecosystem services; sustainability; resilience; or sustainable intensification.
- The absence of pollinating insects can generate a great loss of productivity, since it is the pollinators that transmit the pollen so that it will give origin to the formation of the fruits.
 - The stimulus to grow leguminous plants in agriculture, increases the biological nitrogen fixation in the soil, resulting in a considerable reduction in the use of nitrogen fertilizers, reduction of costs in agricultural activities and, consequently, increase of productivity.
 - The indiscriminate introduction of exotic species is one of the main causes of native diversity loss in Brazil. Many exotic species are introduced for ornamental purposes or in crops without containment, being rapidly disseminated in a favorable environment and in the absence of population control factors (predators), establishing large populations and decimating more fragile ecosystems.
 - The presence of biodiversity is a guarantee of traditional peoples cultural identity, besides being a determining factor for the food security in these communities. In the decade of 1990, indigenous peoples of the Kraho ethnic group suffered from a great famine, due to the loss of a very important maize variety in the feeding of villages. In contact with Embrapa researchers, the Indians discovered that there where seeds of this maize variety, collected in research expeditions, stored in ex situ conservation chambers. After a partnership between Embrapa and the kaho people, the maize was returned to the village and thus returning the cultural identity and food security lost over time.
 - The diversity of species present in agricultural crop helps in the natural control of pests and diseases, reducing the use of agrochemicals and as a result, environmental contamination.

³² Reference: question 58 of country report guidelines.

³³ Reference: question 57 of country report guidelines.

Diversity also contributes to the food security of the population, guaranteeing the supply of varied foods throughout the year.

- c) List in Table 5 examples whereby the use of biodiversity for food and agriculture contributed to cope with climate change, invasive alien species, and natural or human-made disasters.

Table 5. Examples whereby the use of biodiversity for food and agriculture (BFA) contributed to cope with climate change, invasive alien species, and natural or human-made disasters

Objective	Description
Use of BFA to adapt to and mitigate climate change ³⁴	Implementation of sustainable food production and distribution systems with emphasis on the promotion of agroecological systems, preservation and enhancement of agrobiodiversity, creation of seed banks, productive diversification, and recovery and preservation of soils and water sources.
Use of BFA to manage the spread of/control invasive alien species ³⁵	
Use of BFA to prevent natural or human-made disasters and/or reduce their effects on livelihoods, food security and nutrition ³⁶	Agroforestry and agroecological systems that use biodiversity in their favor have a greater productive diversity and with this they present a greater capacity for recovery after disturbances.
Projeto Araucária – implementado no estado de Santa Catarina, nos anos de 2013-2015 (https://www.projetoarucaria.org.br)	Conjunto de ações estratégicas para a minimização dos efeitos das mudanças climáticas, por meio da fixação de carbono e emissões evitadas, com base na reconversão produtiva de áreas; recuperação de áreas degradadas e conservação de florestas e áreas naturais, contribuindo assim para o desenvolvimento sustentável da região.

- d) List and briefly describe ecosystem/landscape/seascape approaches³⁷ that have improved the management and use of BFA in the region.³⁸

- e) Provide examples of activities undertaken to maintain and use traditional knowledge of associated

³⁴ Reference: question 69 of country report guidelines.

³⁵ Reference: question 46 of country report guidelines.

³⁶ Reference: question 43 of country report guidelines.

³⁷ The ecosystem approach concept is generally understood to encompass the management of human activities, based on the best understanding of the ecological interactions and processes, so as to ensure that ecosystems structure and functions are sustained for the benefit of present and future generations. Ecosystem approaches include the Convention on Biological Diversity's Ecosystem Approach, Integrated Land Use Planning, Integrated Water Resource Management, Sustainable Forest Management, Code of Conduct for Responsible Fisheries, Ecosystem approach to fisheries management, etc.

- A "landscape approach" means taking both a geographical and socio-economic approach to managing the land, water and forest resources that form the foundation – the natural capital – for meeting our goals of food security and inclusive green growth. By taking into account the inter-actions between these core elements of natural capital and the ecosystem services they produce, rather than considering them in isolation from one another, we are better able to maximize productivity, improve livelihoods, and reduce negative environmental impacts.

³⁸ Reference: questions 60, 61 and 80 of country report guidelines.

biodiversity and wild foods.³⁹

- A measure of impact was the creation of the National Policy for the Sustainable Development of Traditional Peoples and Communities (PNPCT) established in 2007 by Decree No. 6.040. The policy is an action of the Federal Government that seeks to promote the sustainable development of traditional people and communities. This policy emphasizes the recognition, strengthening and securing of their land, and their social, environmental, economic and cultural rights. It further contributes to the respect and value of the identity, forms of organization and institutions of traditional people and communities.
- The actions and activities related to the achievement of the objectives of the National Policy for the Sustainable Development of Traditional Peoples and Communities occur in an inter-sector and integrated manner. Thus, the responsibility of the National Commission for Sustainable Development of Traditional Peoples and Communities (CNPCT in Portuguese), created by Decree of July 13, 2006, is to coordinate the implementation of this policy.
- The Nacional Commission is composed of fifteen representatives of the agencies and entities of the federal public administration and fifteen representatives of non-governmental organizations. It is chaired by the representative of the Ministry of Social Development and Fight against Hunger (MDS in Portuguese). Among the civil society representatives of CNPCT are the traditional communities of faxinalenses people, people of gypsy culture, indigenous peoples, maroons, peoples related to the collect of mangaba, peoples related to the break of coconut-babassu, traditional marshland communities, fishermen, caiçaras, Pomeranians, Retireiros of araguaia communities and bottom pasture communities.
- Another initiative of great relevance was the recognition by the Institute of National Historical and Artistic Heritage (IPHAN in Portuguese) of the Traditional Agricultural System of the Rio Negro as an Intangible Cultural Heritage of Brazil. The recognition was formalized in December 2010. The construction process of the safeguarding plan for this agricultural system – that has cassava cultivation as a structural element and includes 23 indigenous ethnic groups – considered the practices and principles of traditional populations for conservation of agro-biodiversity.
- A national policy of Agro-ecology, which was built in conjunction with the civil society was launched on August 20, 2013 through Decree No. 7794. Among others aspects, the policy aims the enhancement of agricultural biodiversity and socio-biodiversity products. Furthermore, its objective is to encourage the local experiences of use and conservation of plant and animal genetic resources, especially those that involve the management of local, traditional or landraces breeds and varieties. Moreover, it aims to contribute for reducing gender inequalities through actions and programs that promote the economic empowerment of women.
- Several Brazilian ministries and civil society representatives are committed to the

³⁹Reference: questions 32, 33, 38 and 39 of country report guidelines.

- implementation of the National Plan for Organic Production and Agro-ecology which can be found on the website
- http://www.mda.gov.br/portalmda/sites/default/files/ceazinepdf/cartilha-It_PLANO_NACIONAL_DE_AGR-379811.pdf
 - Brazil is not only a biologically diverse country. Few countries can proudly claim to have so many ethnic groups and so many languages inside its borders. There are now more than 230 indigenous peoples with very few members in number. Some of these communities have population of dozens; most of them have hundreds of members, and only a dozen of them have thousands of inhabitants. They speak 180 different languages, and 110 languages of which have fewer than 400 speakers. Of these 230 peoples, more than 210 inhabit the Brazilian Amazon, which correspond to almost half of the 446 recognized indigenous peoples in the entire Amazon basin by various countries that comprise it. (<http://raisg.socioambiental.org/node/106>).
 - This means for a project of technological science policy a huge comparative advantage in biodiversity resources and accumulated knowledge and production.
 - This last point has already incorporated in various official documents: traditional knowledge, contrary to what many may think, is not only a repository of knowledge, passed down from one generation to the next. Predominately, and it is that defines them, it is a knowledge that continue to be produced in a specific way; produced by protocols and methods which should not be confused with the hegemonic science. In other words, what characterize traditional knowledge systems are the specific methods and the protocols that they make use. What should be established here is that traditional knowledge systems should not be treated merely as "treasures", a finite legacy of the past, but as open systems of knowledge production that continue to produce important results.
 - Therefore, there are two dimensions that must be considered simultaneously in a policy for science, technology and innovation involving traditional knowledge.
 - One of them is the contribution that traditional knowledge systems can make to academic science and how to establish synapses, connections between them. When this dialogue and connections are established, there is the possibility of leveraging scientific and technological innovation based on complementation of knowledge. This unique combination improves the chances of innovation, not only in terms of new products, but even in terms of new concepts and models.
 - The second dimension, equally important, is to promote the maintenance of these systems, in other words, to give them operating conditions in the present and propel them into the future. For that is being built at the Brazilian Ministry of Science, Technology and Innovation a program that aims to stimulate cross-cultural research in Brazil.
 - The Strategic and Participatory Management Secretariat (SGI in Portuguese) of Embrapa created in 2014 a book collection about "Ethnoknowledge", which aims to build a landmark for survey of traditional peoples and communities and report experiments being undertaken by researchers in different regions of the country.
 - A practice that has spread throughout Brazil and is an example of success in the recognition

of traditional knowledge for biodiversity conservation is being carried out by Embrapa to recognize indigenous people and local and traditional people and communities as guardians of agrobiodiversity. They are collector-farmers who keep in their communities different seed varieties and are recognized as providers of relevant services for the conservation and distribution of seeds.

- Embrapa has undertaken work in situ conservation of plants (especially fruit trees) native to different Brazilian biomes, identifying best practices for biodiversity conservation. In 2014, the project “Integrating the Conservation and Sustainable Use of Biodiversity in Production Practices with Management of Non-Timber Forest Products and Agroforestry Systems in Forest Landscapes for Multiple Uses High Value Conservation” was approved by the Global Environment Fund (GEF), a project under coordination of Embrapa Genetic Resources and Biotechnology.
- Brazilian legislation on the subject promotes the integration of conservation policies for Brazilian genetic heritage and reduction strategies to combat poverty and the improvement of public health by facilitating the responsible use of biodiversity for technological development and innovation in the area of biotechnology.
- With the experience garnered from the Use of Genetic Heritage and Benefit Sharing Contracts - CURBs signed in the presence of MP 2.186- No 16/2001, the potential of productive chains that use biodiversity products for poverty reduction and improvement of life quality for local populations have been identified.
- The accumulated experience in projects to strengthen productive chains performed by private entities from the cosmetics sector in different municipalities had as observed results the increase in the average monthly income and the diversification of the income composition of these populations. With increased income from the use of the local biodiversity, there was partial replacement of other potentially harmful activities with great potential for harm to the environment, such as logging in priority areas for conservation.
- In this scenario, the Ministry of the Environment has been engaged in promoting the substitution of predatory activities for activities from economic sectors that use biodiversity in a sustainable way through projects are executed with government and private players.
- One of the goals of these actions is the development of indigenous peoples, traditional communities and family farmers as key links of the productive sectors of the “standing forest”. These actions may support the generation of income and the reduction of the pressures on the environment, allied to the appreciation and protection of associated traditional knowledge.
- The appreciation and protection of traditional knowledge occurs through actions that recognize the role of indigenous peoples, traditional communities and family farmers in the management of genetic resources conserved in their territories. This strategy includes, for example, the fostering of community protocols. Community Protocol is a tool recognized by the CBD and the Nagoya protocol in which each community can reaffirm their identity, organization and the rules from their customs of biodiversity management.

- f) Identify possible needs and priorities in terms of the sustainable use of biodiversity for food and agriculture, and in particular of associated biodiversity and wild foods.
- Identification of native species with potential for use.
 - Take advantage of the agricultural potential and cultural diversity of each region.
 - Agronomic aspects (propagation, availability of seedlings, technical assistance, management, harvest and post-harvest).
 - Organization of production chains (all stages, from planting to marketing – cooperatives and associations)
 - Marketing (institutional markets and short chains)
 - Outreach strategies in partnership with the community – know how to create and / or expand demands
 - The area that needs most attention is production and marketing (supply) of wild foods. Priority should be given to marketing opportunities that could be explored by promoting social entrepreneurial at the grassroots level, at the private sector level or by strengthening links with institutional markets.

2.2. Conservation

- a) Describe the status of *in situ* conservation of associated biodiversity and wild food species in your country⁴⁰:
1. List and describe any existing national *in situ* conservation initiative(s).

Consolidated table of Conservation Units in Brazil.

Category	Sphere						Total	
	National		State		Municipal			
	N°	Area (km ²)	N°	Area (km ²)	N°	Area (km ²)	N°	Area (km ²)
Integral protection								
Ecologica Station	32	74.947	61	47.596	4	10	97	122.552
Natural Monument	3	443	29	906	14	136	46	1.485
Parks	73	264.867	206	94.200	127	443	406	359.510
Wildlife Refuge	8	2.692	41	2.941	5	161	54	5.794
Biological Reserve	31	42.677	23	13.447	8	51	62	56.174
Total Integral protection	147	385.625	360	159.089	158	801	665	545.515
Sustainable use								
Forest	67	178.25	39	135.856	0	0	109	314.081
Extractive Reserve	62	124.724	28	19.867	0	0	90	144.591

⁴⁰ Reference: questions 31 (Table 13) and 37 (Table 17) of country report guidelines.

Sustainable Development Reserve	2	1.206	32	111.251	5	171	39	112.447
Fauna Reserve	0	0	0	0	0	0	0	0
Environmental Protection Area	33	101.731	189	339.260	85	26.171	307	467.162
Area of Relevant Ecological Interest	13	341	26	455	9	138	48	934
Permanent Reserve for Natural Heritage	635	4.831	209	765	1	0	845	5.596
Total Sustainable Use	812	410.873	523	607.454	100	26.480	1435	1.044.812
Total	959	796.503	883	766.543	258	27.281	2100	1.590.327
Area considering overlap	959	790.736	883	760.221	258	27.243	2100	1.550.436

Source: CNUC/MMA - www.mma.gov.br/cadastro_uc. Atualized in: 10/07/2017

2. Indicate which species/groups of species are being conserved and with what objective(s).

Wild food species conserved (scientific name)	Site name and location	Size and environment	Conservation objective(s)	Actions taken
<i>Caryocar brasiliense</i>	RDS Nascentes Geraizeiras	37.200 ha; Cerrado	Conserve biodiversity and environmental services, guarantee area for traditional communities' livelihoods	Control of activities degrading environment, restoration of degraded areas
<i>Annona crassiflora</i>	RDS Nascentes Geraizeiras	37.200 ha; Cerrado	Conserve biodiversity and environmental services, guarantee area for traditional communities' livelihoods	Control of activities degrading environment, restoration of degraded areas
<i>Hancornia speciosa</i>	RDS Nascentes Geraizeiras	37.200 ha; Cerrado	Conserve biodiversity and environmental services, guarantee area for traditional communities' livelihoods	Control of activities degrading environment, restoration of degraded areas

3. Describe any existing subregional/regional *in situ* conservation initiative(s) the country is involved in.

- Biota Program: Funded by the Foundation for Research Support of the State of São Paulo (FAPESP) and involves the support of individual research projects aiming at a better understanding of Brazilian biodiversity, as well as multi-institutional long-term collective research projects (<http://www.fapesp.br/5027>).

- Protected Areas of the Amazon Program (ARPA): Started in 2002, it is the largest tropical forest conservation program on the planet and the most significant one related to conservation units in Brazil. The objective is to expand and strengthen the National System of Conservation Units (SNUC) in the Amazon, protect 60 million hectares, secure financial resources for the management of these areas in the short / long term and promote sustainable development in that region (<http://arpa.mma.gov.br>);
- Plan of Action for the Prevention and Control of Deforestation in the Legal Amazon (PPCDAM): Created in 2004 and aims to continuously reduce deforestation and create the conditions for the transition to a model of sustainable development in the Legal Amazon (<http://redd.mma.gov.br/pt/acompanhamento-e-a-analise-de-impacto-das-politicas-publicas/ppcdam>);
- Plan of Action for the Prevention and Control of Deforestation and Burning in the Cerrado (PPCerrado): Part of the Project for Monitoring Deforestation in the Brazilian Biomes by Satellite, coordinated by the Ministry of the Environment, the Brazilian Institute for the Environment and Renewable Natural Resources (IBAMA) and the United Nations Development Program (UNDP) (<http://www.mma.gov.br/informma/item/618-ppcerrado>).

b) Describe the status of *ex situ* conservation⁴¹ of associated biodiversity and wild food species in your country:

1. List and describe any existing national *ex situ* conservation initiative(s).

- National Network of Genetic Resources – involve more than 600 scientists of 100 institutions integrating research centers of Embrapa and other research organizations throughout Brazil.

2. Indicate which species/groups of species are being conserved and with what objective(s).

Ex situ conservation or management activities or programmes for associated biodiversity for food and agriculture.

Organisms, species and sub-species (where available) conserved	Size of collection	Conservation conditions	Objective(s)	Characterization and evaluation status
Components of associated biodiversity: PLANTS				
Rice	27050	seeds	conservation, research, breeding	Genetical diversity, ecology, geographic distribution, molecular analysis
Oats	480	seeds		
Rye	116	seeds		
Barley	2314	seeds		
Millet	1740	seeds		
Corn	3922	seeds		
Subtropical corn	132	seeds		

⁴¹ Reference: questions 30 (Table 12) and 36 (Table 16) of country report guidelines.

Sorghum	7215	seeds		
Wheat	15118	seeds		
Triticale	290	seeds		
Cotton	896	seeds		
Peanut	228	seeds		
Peanut forage	92	field		
Arachis wild relatives	1300	seeds		
Canola	94	seeds		
Safflower	911	seeds		
<i>Cuphea</i> spp.	58	seeds		
Pea	837	seeds		
Bean	16447	seeds		
Cowpea beans	3942	seeds		
Sesame	1433	seeds		
Sunflower	2060	seeds		
Cashew	650	seeds	conservation, research, breeding	
Moringa	23	field		
Olive	50	field		
Pinhão-mansô (<i>Jatropha curcas</i>)	189	seeds and field		
Sisal	37	field		
Soybean	18024	seeds		
Lettuce	50	seeds		
Garlic	144	field		
Eggplant	783	seeds		
Brassicaceae	100	seeds		
Pimentas (<i>Capsicum</i> spp.)	2078	seeds		
Onion	201	seeds		
Carrot	74	seeds		
Cucurbitaceae	480	seeds		
Pumpkins	3089	seeds		
Unconventional vegetables	85	field		
<i>Arracacia xanthorrhiza</i>	55	field		conservation, research, breeding
Watermelon	369	seeds		
Melon	325	seeds		
Cucumber	1482	seeds		
Black pepper	10	seeds		
Okra	270	seeds		
<i>Solanum</i> spp. (wild relatives)	333	seeds		
Tomato	1100	seeds		
<i>Mendicago</i> spp.	148	seeds and field		
<i>Lolium multiflorum</i>	240	seeds		
<i>Brachiaria</i> spp.	670	field		
<i>Cenchrus ciliaris</i>	117	seeds		
<i>Pennisetum</i> spp.	111	seeds and field		
<i>Desmanthus</i> spp.	109	seeds and field		

Forages of importance to the Amazon Region	210	seeds		
Forages of importance for the Southern Region	148	seeds and field		
Forages of importance for the Cerrado	5538	seeds		
Forages of importance to the Pantanal	55	field, green house	conservation, research, breeding	
<i>Panicum maximum</i>	430	seeds and field		
<i>Paspalum</i> spp.	318	seeds and field		
<i>Stylosanthes</i> spp.	1308	seeds		
Pineapple (<i>Ananas</i> spp.)	624	field, in vitro		
Curauá-fiber (<i>Ananas</i> spp.)	58	field		
Bacuri (<i>Platonia insignis</i>)	172	field		
Baru (<i>Dipteryx alata</i>)	17	field		
Cashew (<i>Anacardium</i> spp.)	588	field, green house		
Camu-camu (<i>Myrciaria dúbia</i>)	120	field		
Brazil nuts (<i>Bertholletia excelsa</i>)	10	field		
Cupuaçu (<i>Theobroma grandiflorum</i>)	610	field		
Fruit trees native to the Mid North Region	112	field		
Native fruit trees of the North Region	17	field		
Native fruit trees of the Southern Region	76	field		
Jenipapo (<i>Genipa americana</i>)	172	field		
Mangaba (<i>Hancornia speciosa</i>)	281	field	conservation, research, breeding	
Passion fruit (<i>Passiflora</i> spp.)	418	seed, field, green house		
Muruci (<i>Byrsonima crassifolia</i>)	17	field		
Pequi (<i>Caryocar brasiliense</i>)	15	field		
Pitaya	43	field		
<i>Spondias</i> spp.	133	field		
Avocado	39	field		
Acerola (<i>Malpighia</i> spp.)	156	field		
Banana (<i>Musa</i> spp.)	259	field		
<i>Citrus</i> spp.	647	green house		
Apple	444	field		
Pear	200	field		
Papaya	243	seeds and field		

Mango	532	field	
Strawberry	20	green house, in vitro	
Prunoids	200	field	
Araçá (<i>Psidium</i> spp.)	160	seeds and field	
Kiwi	25	field	
Grape	1642	field, in vitro	
Amburana (<i>Amburana cearensis</i>)	62	field	
Espinheira-santa (<i>Maytenus</i> spp.)	159	field	
Fennel, ginseng-Brazilian, guago, Lippia, ora-pro-nobis	423	seed, field, in vitro	
Medicinal, Biocidal and Aromatic Properties of Amaz. Western	38	field	conservation, research, breeding
Medicines from the Eastern Amazon	108	field and in vitro	
Medicinal products of importance for the Cerrado	110	field	
Mint	75	field, green house and in vitro	
Indian Nim (<i>Azadirachta indica</i> .)	45	field	
<i>Piper</i> (Long Pepper and Monkey Pepper)	3021	field	
Timbo (<i>Derris</i> spp.)	52	field	
Urucum (<i>Bixa orellana</i>)	15	field	
Cane	200	field	
Guarana	270	field	
Bromeliads	161	green house	
Cactaceae	166	green house	
Ornamental trees of importance to the Northeast Region	145	green house	
Ornamental of importance for the North Region	23	green house	conservation, research, breeding
Ornamental of importance for the Pampa Biome	17	green house	
Ornamental Bulbs	150	green house	
Orchids	200	bulbs, green house	
<i>Pachira quinata</i>	17	field	
Conifer and Hardwoods	772	field	
<i>Eucalyptus</i> spp.	62	seeds, field	
<i>Pinus</i> spp.	932	seeds, field	
Rubber tree	868	field	

Açaí (<i>Euterpe</i> spp.)	304	field		
Babaçu (<i>Attalea</i> spp.)	100	field		
Bacaba (<i>Oenocarpus</i> spp.)	253	field		
Caiaue (<i>Elaeis oleifera</i>)	239	field		
Palm oil (<i>Elaeis guineenses</i>)	329	field		
Inajá (<i>Maximiliana maripa</i>)	63	field		
Macaúba (<i>Acrocomia aculeata</i>)	100	field		
Pupunha (<i>Bactris gasipaes</i>)	60	field		
Pupunha (INPA) (<i>Bactris gasipaes</i>)	375	field		
Tucumã (<i>Astrocaryum</i> spp.)	182	field		
Coconut (<i>Cocos nucifera</i>)	36	field		
Buriti (<i>Mauritia flexuosa</i>)	30	field		
Potato	410	field		
Sweet potato	860	field, green house		
Cassava (<i>Manihot esculenta</i>)	3962	field		
<i>Manihot</i> (wild relatives)	600	field		

Organisms, species and sub-species (where available) conserved	Size of collection	Conservation conditions	Objective(s)	Characterization and evaluation status
Components of associated biodiversity: ANIMALS				
Asininos	151	Purified DNA	conservation, research and breeding	Phenotypic and genetic characterization of germplasm; evaluation of productive potential; ecology; reproductive strategies (fishes); genetical diversity
Bubalinos	638	Purified DNA		
Caprinos	1221	Purified DNA		
Equinos	794	Purified DNA		
Gado de leite	3013	Purified DNA		
Gado de corte	226	Purified DNA		
Galináceos	188	Purified DNA		
Ovinos	4519	Purified DNA		
Peixes de água doce	158	Purified DNA		
Peixes marinhos	123	Purified DNA		
Quelônios	273	Purified DNA		
Suinos	606	Purified DNA		
Asininos	5	Sperm		
Caprinos	48	Sperm		
Equinos	12	Sperm		
Gado de corte	141	Sperm		
Ovinos	65	Sperm		
Suinos	14	Sperm		

3.

4.

Organisms, species and sub-species (where available) conserved	Size of collection	Conservation conditions	Objective(s)	Characterization and evaluation status
Components of associated biodiversity: MICRORGANISMS				
Ascomycota	38	<p>Preserved unit: Varies according to the type of micro-organism. In the case of fungi, they may be different types of spores or other structures of reproductive or vegetative origin. Vegetative cells such as mycelium or yeasts are less common but also work for some species that do not produce spores or stay only in the yeast stage.</p> <p>In the bacteria conservation can be used vegetative cells or spores, in the case of the sporulants.</p> <p>Conditions: cryopreservation, cooling, dehydration.</p>	<p>Conservation, research, breeding, development of products for the medical, pharmaceutical and industrial area, genetic engineering</p>	<p>Genetic characterization of germplasm; ecology; biological control; development of products (agricultural, medical, pharmaceutical and industrial uses)</p>
Bacteria (without identification)	3			
Hypocreales	2			
Acetobacteraceae	274			
Acidithiobacillaceae	1			
Actinomycetaceae	21			
Alcaligenaceae	10			
Amphisphaeriaceae	1			
Atheliaceae	10			
Azotobacteraceae	4			
Bacillaceae	2623			
Beijerinckiaceae	2			
Bionectriaceae	37			
Botryosphaeriaceae	209			
Bradyrhizobiaceae	1			
Bruceaceae	7			
Burkholderiaceae	652			
Campylobacteraceae	6			
Cellulomonadaceae	1			
Ceratobasidiaceae	2			
Ceratocystidaceae	4			
Chlorellaceae	39			
Clavicipitaceae	612			
Comamonadaceae	5			
Cordycipitaceae	566			
Corticaceae	1			
Corynesporascaceae	1			
Davidiellaceae	20			
Debaryomycetaceae	76			
Dermateaceae	14			
Diaporthaceae	23			
Elsinoaceae	10			
Enterobacteriaceae	229			
Enterococcaceae	10			
Fabaceae	5			
Glomerellaceae	3114			
Halothiobacillaceae	8			
Hyphomicrobiaceae	5			
Hypocreaceae	1822			
Incertae sedis	5			
Lactobacillaceae	5			

Magnaporthaceae	11217			
Methylobacteriaceae	30			
Metschnikowiaceae	4			
Microbacteriaceae	3			
Microbacteriaceae	61			
Micrococcaceae	1			
Mortierellaceae	6			
Mucoraceae	2			
Mycobacteriaceae	4			
Mycoplasmataceae	5			
Mycosphaerellaceae	533			
Nectriaceae	1316			
Nocardiodaceae	1			
Not assigned	177			
Burkholderiales	4			
Ophiocordycipitaceae	13			
Ophiostomataceae	4			
Orbiliaceae	7			
Oxalobacteraceae	158			
Paenibacillaceae	27			
Pasteurellaceae	61			
Phyllobactereaceae	23			
Phyllobacteriaceae	32			
Pichiaceae	360			
Planistromellaceae	1			
Plectosphaerellaceae	1			
Pleosporaceae	63			
Pseudanabaenaceae	3			
Pseudomonadaceae	132			
Pucciniaceae	14			
Pythiaceae	68			
Rhizobiaceae	2792			
Rhodocyclaceae	5			
Rhodospirillaceae	732			
Saccharomycetaceae	622			
Saccharomycodaceae	1167			
Saccharomycopsidaceae	42			
Sacchettoeciaceae	2			
Sclerotiniaceae	53			
Sclerotiniaceae	126			
Sphingomonadaceae	9			
Sporidiobolales	27			
Staphylococcaceae	294			
Streptococcaceae	129			
Streptomycetaceae	4			
Togniniaceae	3			

Tremellaceae	9			
Trichocomaceae	261			
Trichomonascaceae	21			
Valsaceae	1			
Venturiaceae	69			
Xanthobactereaceae	27			
Xanthomonadaceae	153			
Xylariaceae	67			
unclassified Oscillatoriales	2			

5. Describe any existing subregional/regional *ex situ* conservation initiative(s) the country is involved in.

- Embrapa Amazonia Oriental: It maintains collections of germplasm of Amazonian palms, of the genera *Euterpe*, *Astrocaryum*, *Oenocarpus* and *Bactris*; as well as collections of medicinal plants and fruits native to the Amazon biome;
- Instituto de Botânica de São Paulo: Collection of Algae, Cyanobacteria and Fungi Cultures;
- Instituto Agronômico de Campinas: Maintains 21 collections of germplasm, standing out the collections of native germplasm of passion fruit, pineapple, medicinal and aromatic plants;
- Fundação Jardim Botânico do Rio de Janeiro: It maintains a wide collection of live plants (arboretum), a bromeliary with 530 species of diverse Brazilian formations (Amazon, Atlantic Rainforest, restingas, caatingas) and a collection of seeds storeings in the long term (-20°C);
- Instituto Nacional de Pesquisas Amazônica: Maintains zoological and microbiological collections alive. The zoological collection represents an important genetic bank for taxonomic, systematic and biotechnological studies.

c) Identify possible needs and priorities in terms of the conservation of biodiversity for food and agriculture, and in particular of associated biodiversity and wild food species.

- Integration of biodiversity conservation strategies in Protected Areas (PA) with in situ conservation of genetic resources in Genetic Reserves. This strategy seeks to integrate the actions aimed at the conservation of biodiversity, through the PAs, with the conservation of genetic resources, through the implementation in these Protected Areas (PA) of Genetic Reserves (GRs) for species of economic interest or threatened with extinction. Genetic reserves constitute a mode of conservation of genetic resources in situ and also a key factor for the integration of biodiversity conservation policies with that of genetic resources. The integration of Genetic Reserves with the National System of Conservation Units offers the great advantage of ensuring the perpetuity of these Reserves and the permanent in situ conservation of species of current or potential economic value, with emphasis on the wild

relatives of the main species of cultivated plants and for landraces. In order to do so, it is necessary to define the priority species, characterize the areas with the greatest genetic variability and map the respective populations for subsequent implantation of the Genetic Reserves, which will show the scientific value of the genetic heritage present in each PA. The results derived from these paths will contribute to guarantee the effectiveness of these areas for the conservation of socio-biodiversity, promotion of sustainable development and reduction of poverty, as well as the awareness of the Brazilian society about the strategic importance of these protected areas.

2.3 Access and exchange⁴²

- a) Describe in Table 6 the main measures in the country (i) regulating access to; and (ii) ensuring the fair and equitable sharing of benefits arising from the utilization of biodiversity for food and agriculture (BFA).

Table 6. Description of the main measures in the country (i) regulating access to; and (ii) ensuring the fair and equitable sharing of benefits arising from the utilization of biodiversity for food and agriculture (BFA).⁴³

Components of BFA	Description of measures governing access to BFA	Description of measures regulating the fair and equitable sharing of benefits arising from the utilization of BFA
Genetic resources	The new legal framework of Brazilian genetic heritage and associated traditional knowledge management (Law No. 13,123/2015 and Decree No. 8772/2016) reduces the financial and regulatory costs of Brazilian biodiversity research activities and technological development. This new regulation contemplates several improvements in the government's management agenda. Management was facilitated by the creation of two electronic systems designed to oversee and trace activities resulting from access. The National Management System of	Law No. 13,123/2015 also creates the National Program of Benefit-Sharing - PNRB which will be implemented by the National Benefit Sharing Fund - FNRB to apply resources in various initiatives such as the implementation of Sustainable Development Plans of Traditional Peoples and Communities, which will stimulate and strengthen the practices of peoples and communities that are relevant for biodiversity conservation. It also promotes the integration of biodiversity conservation policies to strategies directed at poverty reduction
PGRFA		
AnGR		
FGR		
AqGR		
<i>Associated biodiversity</i>		
Micro-organisms		
Invertebrates		
Vertebrates		
Plants		
<i>Wild foods</i>		

⁴² Reference: questions 72 and 73 of country report guidelines.

⁴³ Measures facilitating access to the different components of biodiversity for food and agriculture usually vary according to the intended use of the resource (e.g. any use, research and development, commercial use). Examples of possible measures consist of the need to obtain prior informed consent (PIC), sharing benefits based on mutually agreed terms (MAT), having special considerations in place for access to resources held by indigenous peoples and local communities, etc.

<p>Genetic Heritage and Associated Traditional Knowledge - SisGen, will be the interface between the administrated entities, users, providers and the Board of Genetic Heritage Management, thus fulfilling the obligations contained in Law No. 13,123. SisGen will be the recipient of all the registries, authorizations, notifications of finished products or reproductive materials, and will generate the respective receipts and certificates.</p> <p>The other proposed system is the traceability system of the activities that result from access to genetic resources or associated traditional knowledge. It is one of the tools created by the legal framework that increased control over the traceability of accesses, remittances and dispatches, and brought improvements in the monitoring of benefit sharing. Such a system will have the collaboration of various public bodies that regulate different productive sectors, until reaching the sector of product registration for commercial exploitation. This legal norm also assigns government agencies the function of "checkpoints" to guarantee compliance with the law.</p> <p>Through the implementation of these systems it will be possible to maintain and manage a greater amount of information on the use of genetic resources and associated traditional knowledge. Besides this, once connected to other databases and information systems from federal public administration, modern high efficiency instruments can be implemented that have the capacity to verify information on the activities resulting from access to genetic resources or associated traditional knowledge, as well as those that render economic return.</p>	<p>and public health, as it fosters the responsible use of biodiversity for technological development and innovation in the area of biotechnology.</p> <p>Another point of interest of the biodiversity-based productive chains is benefit sharing at a single point of the production chain. The law determines that the benefits arising from the commercialization finished product should be shared by the last manufacturer in the productive chain, or by the producer of the reproductive material (in case of agricultural activities). The Brazilian biodiversity-based production chains are very fragmented and have a large number of intermediate links that deal with the initial processing of raw materials. The above mentioned provision intends to exempt the cooperatives and micro businesses from unnecessary demands without sacrificing the traceability of the product, while at the same time directing the focus of the benefit sharing on the product with the most added value on the productive chain.</p> <p>Brazilian law complies with provisions from international treaties, and foresees benefit sharing in monetary and non-monetary terms.</p> <p>From the perspective of indigenous peoples, traditional communities and traditional farmers, Law No. 13,123/2015 guarantees the protection of their knowledge; the right to participate in national decision-making processes on matters related to the conservation and sustainable use of their traditional knowledge; and the free exchange and</p>
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	<p>The law assures the participation of representatives from these groups in the Genetic Heritage Management Council - CGen, the national ABS authority, and the Steering Committee of the National Benefit Sharing Fund - also created by law.</p>	<p>dissemination of genetic heritage and associated traditional knowledge practiced amongst them for their own benefit, based on their customs and traditions.</p>
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b) Identify possible needs and priorities in terms of the policies and regulations governing the access to and ensuring the fair and equitable sharing of benefits arising from the utilization of biodiversity for food and agriculture, and in particular of associated biodiversity.

- Formulation and implementation of training programs on ABS as well as Community Protocols and for multipliers;
- Strengthen activities of production chains with access to genetic resources and associated traditional knowledge and capacity building in ABS;
- Women's practices and knowledge should be recognized and valued.

III. Policies, institutions and capacity

3.1 Policies, programmes, institutions and other stakeholders

a) Describe relevant policies and programmes the country has adopted and is implementing to support the conservation and sustainable use of biodiversity for food and agriculture, and specify to which extent they address associated biodiversity and wild foods.⁴⁴ Relevant policies and programmes are those that aim at:

- the coordinated use and conservation of sectoral genetic resources
 - Agricultural Policy for Planted Forests (Decree 8.375/2014).
 - Agricultural Risk Zoning (ZARC) is an instrument of agricultural policy and risk management in agriculture. The study is designed with the objective of minimizing the risks related to adverse climatic phenomena and allows each municipality to identify the best planting season of the crops, in the different types of soil and crop cycles. The technique is easily understood and adopted by farmers, financial agents and other users.

⁴⁴ Reference: questions 66, 67 and 78 of country report guidelines; Policies and programmes can include incentives or benefits, such as payments, provision of inputs and subsidies, to support activities for the conservation and sustainable use of biodiversity for food and agriculture.

- In the ZARC studies, the parameters of climate, soil and cultivar cycles were analyzed, based on a methodology validated by the Brazilian Agricultural Research Corporation (Embrapa) and adopted by the Ministry of Agriculture, Livestock and Supply.
- National Policy for the Sustainable Development of Aquaculture and Fisheries, regulates fishing activities.
- Interministerial Ordinance MDA-MDS n. 163 of may 11 , 2016, which lists, based on native species of Brazilian fauna, the species of the sociobiodiversity considered for the purpose of commercialization in natura or of its derived products.
- Bolsa Verde program: an initiative that stimulates the community-based environmental conservation and has a target audience of approximately 16,2 million of people living in extreme poverty who are active in the conservation of natural resources in rural areas, priority conservation and sustainable use units and in land reform resettlement projects.
- ICMS Ecological: tax incentives for states and municipalities that carry out activities that preserve biodiversity
- addressing food security and nutrition⁴⁵
 - The Biodiversity for Food and Nutrition Project—officially the *Mainstreaming Biodiversity Conservation and Sustainable Use for Improved Human Nutrition and Well-being* project, or *BFN project*, is a multi-country initiative funded by the GEF with an ambitious goal to mainstream biodiversity conservation to improve nutrition in four countries: Kenya, Sri Lanka, Turkey, and Brazil. The BFN Project is coordinated by Bioversity International and co-implemented by FAO and UNEP. In Brazil, the BFN project tries to mainstream biodiversity conservation and sustainable use for improved nutrition into national food and livelihood security strategies formed or strengthened under Fome Zero Strategy. Part of the Project’s objective is improving the enabling environment for biodiversity for food and nutrition in Brazil. The first step was to strengthen the evidence and knowledge base for the nutritional value of native biodiversity. The BFN Nutritional Composition Database will provide important evidence for the inclusion of nutritious species (wild foods) in public policies and programs focused on food and nutritional security and the promotion of healthy and diversified diets. It will also provide evidence for programs linking biodiversity conservation to income generation.
 - The BFN project in Brazil has identified four existing public policies that could benefit from data on the nutritional value of wild foods. They include the Food Acquisition Program (PAA), the National School Meals Program (PNAE), the National Food and Nutrition Policy (PNAN) and the Minimum Price Guarantee Policy for Biodiversity Products (PGPM-Bio).

⁴⁵The relevant policies and programmes should have an explicit reference to associated biodiversity and/or wild foods.

- The National Policy on Agroecology and Organic Production was established by the Federal Decree n. 7,794, of 20th August 2012. One of its guidelines is the promotion of food and nutritional sovereignty and security and the human right to adequate and healthy food, by means of the provision of organic and agro-ecological products that are free of contaminants that endanger health. One of the instruments of this policy is the National Plan of Agroecology and Organic Production (PLANAPO). In the framework of PLANAPO, in order to promote the agroecological transition by an increasing number of producers, as well as the replacement of conventional pesticides by low toxicity and biological inputs, the proposal of the National Program for Reduction of Pesticide Use (PRONARA) was developed by the Working Group on Pesticides, of the National Commission of Agroecology and Organic Production (CNAPO⁴⁶). This proposal has been discussed and its publication is awaiting approval by all the Ministries involved in the issue.
- the sustainable use and conservation of associated biodiversity
 - Fauna Species Threatened With Extinction: Among the 1,173 species of fauna threatened with extinction that can be considered pollinators, there are 85 bird species (potentially frugivorous, nectarivorous and omnivorous), 63 lepidopteran species, 29 beetle species, seven bat species and four bee species. The later are classified in the category “Endangered (EN)”:
 - *Melipona* (Michmelia) *capixaba* (uruçu-preto)
 - *Melipona* (Michmelia) *rufiventris* (tujuba)
 - *Melipona* (Michmelia) *scutellaris* (uruçu)
 - *Partamona littoralis* (popular name is unknown)
 - Because these species are listed in the Ministerial Order n. 444/2014, they are fully protected. Therefore, the capture, transportation, storage, custody and handling of their specimens may be permitted for research purposes or for species conservation, with the authorization of the Chico Mendes Institute for Biodiversity Conservation (ICMBIO). On the other side, processing and marketing are prohibited. However, such restrictions do not apply to specimens reproduced in captivity duly licensed by a competent environmental agency in accordance with National Action Plans for Conservation of Species Threatened With Extinction (PAN), when existing. PAN are elaborated by ICMBIO, with the purpose of defining actions in situ (in the natural habitat) and ex situ (outside the natural habitat) for conservation and recovery of these species.⁴⁷
- the maintenance of ecosystem services
 - Water Producer Program - The Water Producer Program aims to reduce erosion and sedimentation of water sources in rural areas. The voluntary compliance program provides technical and financial support for the implementation of water and soil

⁴⁶ Available on <http://www.secretariageral.gov.br/atuacao/brasil-agroecologico/comissao-nacional-de-agroecologia-e-producao-organica>; access on 15th May 2017.

⁴⁷ Federal Official Gazette n. 25, of 5th February 2014, section 1, pages 53-54 – MMA Order n. 43, of 31st January 2014.

conservation actions, such as the construction of terraces and infiltration basins, the rehabilitation of secondary roads, the recovery and protection of water, reforestation of permanent protection areas and legal reserve, environmental sanitation. It also provides for the payment of incentives (or a kind of financial compensation) to rural producers who have proven to contribute to the protection and recovery of springs, generating benefits for the basin and the population. The incentives are granted only after partial or total implementation of previously contracted conservation actions and practices and the amounts to be paid are calculated according to the results: reduction of erosion and sedimentation, reduction of diffuse pollution and increase of infiltration of water in the soil.

Environmental Reevaluation for Neonicotinoid Pesticides

- The applications of pesticides containing imidacloprid, thiamethoxam, clothianidin or fipronil, regardless of the technology used, during the flowering season, have been prohibited, with some flexibilizations, since 2012⁴⁸.
- Normative Instruction IBAMA n. 2, of 9th February 2017⁴⁹, establishes guidelines, requirements and procedures for pesticide risk assessment for pollinator insects, using bees as indicator-organisms.
- improving resilience and sustainability of production systems
 - Programa ABC (Low Carbon Agriculture Program) – Actions to be taken to adopt the sustainable production technologies selected to meet the commitments to reduce greenhouse gas emissions.
 - National Policy for the Sustainable Development of Aquaculture and Fisheries, regulates fishing activities.
 - Environmental Regularization Program (PRA) - Program that aims at the environmental regularization of properties and environmental liabilities identified in the CAR (Rural Environmental Register), both in Permanent Preservation Areas (APPs) and in Legal Reserves RLs, through the elaboration, implementation and monitoring of Recovery of degraded areas projects (PRADAs)
 - Sustainable Rural Project - A cooperation project to promote sustainable rural development, aimed at the broad adoption by rural producers of low-carbon agricultural technologies that will restore the productive potential of degraded agricultural areas and allow restoration of legal maintenance areas of native vegetation.
 - Integrated Agricultural Production - Integrated Agricultural Production is focused on the adaptation of productive systems for the generation of high quality food.

⁴⁸ Federal Official Gazette, of 4th January 2013, section 1, page 10 – MAPA Joint Normative Instruction n. 1; Federal Official Gazette, of 5th December 2013, section 1, page 7 – MAPA Joint Normative Instruction n. 30; Federal Official Gazette, of 10th April 2014, section 3, page 129 – IBAMA Statement n. 1.

⁴⁹ Federal Official Gazette, of 10th February 2017, section 1, pages 33-36 – IBAMA Normative Instruction n. 2.

- National Plan of Agroecology and Organic Production (PLANAPO) - It aims to implement programs and actions that encourage the agroecological transition, organic production and agro-ecological basis, enabling the population to improve the quality of life through the supply and consumption of healthy food and the sustainable use of natural resources, constituting an instrument of national police (Pnapo) operationalization and monitoring, evaluation and social control of the actions organized there.
 - supporting farmers, livestock keepers, forest dwellers and fisher folk to adopt and maintain practices that strengthen the conservation and use of biodiversity for food and agriculture
 - Programa ABC (Low Carbon Agriculture Program) – Actions to be taken to adopt the sustainable production technologies selected to meet the commitments to reduce greenhouse gas emissions.
 - National Policy for the Sustainable Development of Aquaculture and Fisheries, regulates fishing activities.
 - the application of an ecosystem/landscape/seascape approach⁵⁰
 - The application of an ecosystem / landscape / seascape approach currently occurs most at the level of programs and projects. This integrative approach allows optimizing efforts to ensure the conservation and sustainable use of biodiversity. As an example in the political sphere we have the definition of Priority Areas for conservation, sustainable use and benefit sharing of biodiversity, that serves as a public policy instrument to support decision making in an objective and participatory way in planning And implementation of actions such as creation of conservation units, licensing, inspection and promotion of sustainable use. In addition, recent projects have presented this approach in their conception as for example the GEF Amazon Sustainable Landscapes program that seeks to promote actions within PAs and in their surroundings in order to reestablish the connectivity of the ecosystem and to guarantee the conservation and the sustainable use of biodiversity throughout the biome.
 - Rural Environmental Register (CAR) - Register in a single database all the rural properties of the country with the respective spatial allocation and verification of the conservation status of the Permanent Preservation Areas (APPs), Legal Reserves (RLs) and Areas of Restricted Use (AUR) .
- b) Provide a short analysis of the strengths and weaknesses of the policies and programmes mentioned above and indicate their level of implementation.⁵¹

BOX 3. Provide up to three examples to highlight how stakeholder groups in the country, such as groups or associations of farmers, forest dwellers, fisher folk and livestock keepers, NGOs or other civil society organizations,

⁵⁰ Reference: question 67 of country report guidelines.

⁵¹ Reference: questions 66 and 67 of country report guidelines.

have actively contributed to the improved sustainable use and/or conservation of biodiversity for food and agriculture and the maintenance of ecosystem services.⁵²

- c) Provide examples of successful interministerial cooperation in the area of conservation and sustainable use of biodiversity for food and agriculture and describe the relevant collaboration mechanisms.⁵³
- Brazilian Sociobiodiversity Native Food Species of Nutritional Value - Ordinance Nº 163 (11 March 2016) signed jointly between the MMA (Ministry of the Environment) and MDS (Ministry of Social Development and Fight Against Hunger). Sixty four of the BFN Project's prioritized species appear on the list. These are the species which the BFN Project in Brazil is focusing on to improve the evidence base for their nutritional value with a view to integrating into relevant national policies and programmes.
 - These species will now be more attractive for family farmers not only to grow and conserve them, but also to use and commercialize, since they now have greater recognition by the federal institutions partners of the BFN Project, especially the Food Procurement Programme (PAA), the National School Feeding Programme (PNAE) and the Minimum Price Guarantee Policy on Biodiversity Products (PGPM-Bio).
- d) Identify possible needs and priorities in terms of policies, programmes and institutions governing biodiversity for food and agriculture, and in particular associated biodiversity and wild food species.⁵⁴
- Greater amount of financial resources applied in programs aimed at sustainable production and use of wild food species.
 - Increase financial investment in research funding and training of professionals capable of working in diverse biodiversity chains, with special attention to native biodiversity.

3.2 Capacity

- a) Identify and prioritize training and education needs that target the conservation and sustainable use of associated biodiversity and describe possible constraints.⁵⁵
- Updating curricula of agricultural science courses with the inclusion of disciplines and activities specifically geared to the knowledge and conservation of Brazilian biodiversity, based on the importance of natural wealth knowledge to increase the productivity and sustainability of agricultural systems
 - Stimulate and expand, through partnerships with the community, garden programs and school

⁵² Reference: question 77 of country report guidelines.

⁵³ Reference: questions 81 and 82 of country report guidelines.

⁵⁴ Reference: question 88 of country report guidelines.

⁵⁵ Reference: questions 85, 86 and 90 of country report guidelines.

gardens focused on teaching agroecological practices.

- b) Identify and prioritize research needs to strengthen the conservation and sustainable use of associated biodiversity, wild foods and ecosystem services and describe possible constraints.⁵⁶
 - The need for research aimed at the development of machinery appropriate to sustainable systems of production and processing of non-timber products from native species.

IV. Regional cooperation

4.1 Regional initiatives the country is involved in to conserve and use biodiversity for food and agriculture

- a) Describe in Table 7 relevant regional policies and programmes embedding the conservation and/or use of biodiversity for food and agriculture, and in particular associated biodiversity, wild food species and ecosystem services.

Table 7. Description of relevant regional policies and programmes that embed the conservation and/or use of biodiversity for food and agriculture, and in particular associated biodiversity, wild food species and ecosystem services.⁵⁷

Regional policies and programmes	Description
Amazon Sustainable Landscape Program (PSAM)	A program that involves Brazil, Colombia and Peru. Its main focus is the creation and consolidation of protected areas, the conservation of landscapes through the development of sustainable agricultural practices within and between protected areas, the strengthening of Policies for the monitoring and recovery of degraded areas and the exchange of knowledge among the countries involved.

4.2 Needs and priorities

- a) Identify possible needs and priorities in terms of embedding biodiversity for food and agriculture, and in particular associated biodiversity, wild foods and ecosystem services into regional and international initiatives.

V. Synthesis of needs and priorities and the possible way forward

Countries may wish to use Table 8 to summarize their needs and priorities, and possible actions to be undertaken, with respect to the four priority areas of the guidelines.⁵⁸

⁵⁶ Reference: questions 87 and 91 of country report guidelines.

⁵⁷ Reference: question 84 of country report guidelines.

⁵⁸ See sections 1.3 (a), 2.1 (f), 2.2 (c), 2.3 (b), 3.1 (d), 3.2, 4.2 (a) of the present guidelines.

Table 8. List of the country’s needs and priorities, and possible actions to be undertaken, to conserve and use biodiversity for food and agriculture.

Priority areas	Needs and priorities	Possible actions to be undertaken⁵⁹
1. Assessment and monitoring		
2. Conservation and sustainable use		
3. Policies, institutions and capacity		
4. Regional and international cooperation		

⁵⁹ Reference: questions 92, 93, 94, 95, 96 and 97 of country report guidelines.

APPENDIX 1

Figure 1. Recommended scope of *The State of the World’s Biodiversity for Food and Agriculture*.

	Ecosystem services	
	Mainly provisioning	Mainly supporting and regulating
Biological resources	<p>Food and non-food products provided by cultivated and wild species and genetic resources of plants, animals (vertebrate and invertebrate), aquatic resources and micro-organisms.</p> <p>Examples include trees (timber, fuelwood), crops (food, feed, fodder and dye), livestock (meat, eggs, hides, fur skins and fibre), fish, wild plants (food, medicine), wild relatives, edible fungi, edible insects, bush meat, crustaceans and mollusks (pearls).</p>	<p>Associated biodiversity: species and genetic resources directly involved in supporting and regulating production systems.</p> <p>Examples include soil and planktonic microbes, pollinators, symbionts and kelp forests.</p>
Relevant CGRFA assessments	<p>Plant genetic resources: First and Second Reports on the <i>State of the World’s Plant Genetic Resources for Food and Agriculture</i></p> <p>Animal genetic resources: First and Second Reports on the <i>State of the World’s Animal Genetic Resources for Food and Agriculture</i></p> <p>Forest genetic resources: <i>The State of the World’s Forest Genetic Resources</i></p> <p>Aquatic genetic resources: <i>The State of the World’s Aquatic Genetic Resources for Food and Agriculture</i> (expected 2017)</p>	<p><i>The State of the World’s Biodiversity for Food and Agriculture</i> (expected 2017)</p>

Note: The scope of *The State of the World’s Biodiversity for Food and Agriculture* includes interactions between plant, animal, forest and/or aquatic genetic resources, ecosystem services (mainly supporting and regulating), associated biodiversity and wild foods.