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# COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

## GROUP OF NATIONAL FOCAL POINTS FOR BIODIVERSITY FOR FOOD AND AGRICULTURE

### Second Meeting

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## AMENDMENTS PROPOSED TO THE DOCUMENT BIODIVERSITY FOR FOOD AND AGRICULTURE – REVISED DRAFT NEEDS AND POSSIBLE ACTIONS

### TABLE OF CONTENTS

	Paragraphs
I. Introduction .....	1
II. Development and presentation of the revised version .....	2–5
<i>Appendix I: Biodiversity for food and agriculture – revised draft needs and possible actions</i>	

<sup>1</sup> Rescheduled from 21–23 April 2020.

## I. INTRODUCTION

1. At its Seventeenth Regular Session, the Commission considered the document *Biodiversity for food and agriculture – needs and possible actions*<sup>2</sup> and requested its Secretary to invite written concrete text proposals and comments from Commission Members and observers, to make these comments available and to consolidate the comments into a revised version of the document.<sup>3</sup> In response to the Secretary's invitation, eight countries provided comments on the draft needs and possible actions. These comments are provided, in their original contexts, in the document *Submissions by countries on the document Biodiversity for food and agriculture – revised draft needs and possible actions*.<sup>4</sup> The text provided in *Appendix I* to the present document comprises a revised version of the draft needs and possible actions that includes country proposals and other potential amendments, in bracketed form, at relevant points in the text.

## II. DEVELOPMENT AND PRESENTATION OF THE REVISED VERSION

2. The Secretariat reviewed the comments submitted by countries and the guidance provided by the Commission. It inserted the concrete text proposals, as fully as possible, into the document in bracketed form at relevant points in the text. In some cases, the proposals were lightly edited for readability and in some cases the surrounding material was edited to accommodate them. The Secretariat also, to the extent possible, drafted text aiming to address the general comments provided by countries and the guidance provided by the Commission. These texts were inserted, in bracketed form, at relevant points in the document. In reviewing the document, the Secretariat identified editorial issues that detracted from the readability and internal consistency of the draft. Potential edits addressing these issues were also included in the document in bracketed form.

3. In cases where a substantial number of revisions appeared to be required, the Secretariat drafted alternative blocks of text and presented them within brackets next to the original equivalents. These texts include shortened and/or restructured introductions and rationales and consolidated and/or re-ordered sets of actions. The alternative text for the Rationale in Section II of the document makes fuller use of the key findings of *The State of the World's Biodiversity for Food and Agriculture*. The alternative texts aim to accommodate, to the extent possible, concrete text proposals put forward by countries, although not necessarily in word-for-word form. In addition, based on various statements in the original text and in the comments submitted by countries, the Secretariat prepared a consolidated set of potential "operative principles" for the implementation of the draft needs and possible actions and inserted them, within brackets, as a potential new section of the document.

4. The text presented in *Appendix I* is marked up as follows:

- [normal text]: original text proposed for deletion or for replacement with an alternative text;
- [**bold text**]: new text proposed as an addition or to replace part of the original draft.
- In some cases, two levels of square brackets (brackets within brackets) are shown, for example if a section of text has been proposed both for deletion and for amendment.
- Potential amendments put forward solely on editorial grounds by the Secretariat are marked with an asterisk (\*).
- The alternative blocks of text are indicated by the words "Alternative text". The blocks of text they potentially replace are indicated by the words "Original text". The proposed operative principles are marked with the words "Additional text".

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<sup>2</sup> [CGRFA-17/19/Report, Appendix C.](#)

<sup>3</sup> [CGRFA-17/19/Report, paragraph 47.](#)

<sup>4</sup> [CGRFA/NFP-BFA-2/21/Inf.3.](#)

5. A consolidated revised version containing no bracketed wording other than that included in the original version is provided in *Appendix I* to the document *Consolidated revisions to the document Biodiversity for food and agriculture –revised draft needs and possible actions*.<sup>5</sup>

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<sup>5</sup> [CGRFA/NFP-BFA-2/21/2](#).

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## APPENDIX I

### BIODIVERSITY FOR FOOD AND AGRICULTURE – REVISED DRAFT NEEDS AND POSSIBLE ACTIONS

#### [Proposed amendments]

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#### I. Introduction

1. Biodiversity for food and agriculture (BFA), along with the ecosystem services it supports, is essential to sustainable food and agriculture. It [is necessary to enable] **[enables]\*** production systems and livelihoods to cope with, and evolve under, changing social, economic and environmental conditions, **[and]\*** is a key resource in efforts to ensure food security and nutrition while limiting or reducing negative impacts on the environment[ and makes multiple contributions to the well-being and livelihoods of many households].\*

2. Over recent decades, the importance of biodiversity and ecosystem services to food security and nutrition, rural and coastal livelihoods, human well-being and sustainable development more generally has gradually been acquiring greater recognition on international agendas. In 1995, the Commission on Plant Genetic Resources became the Commission on Genetic Resources for Food and Agriculture (Commission) and acquired a mandate covering all components of biodiversity of relevance to food and agriculture. Over the years, the Commission has overseen global assessments of [genetic resources in the] plant, animal, forest and aquatic [sectors]\* **[genetic resources]\*** and adopted global plans of action for [genetic resources in the first three of these sectors]\* **[the first three]\*** (referred to in this text as the “sectoral global plans of action”).<sup>6</sup> **[In 2019, the Commission agreed that a global action plan for aquatic genetic resources should be prepared.]\*** The Sustainable Development Goals (SDGs), adopted by the United Nations in 2015, include a number of targets related to the sustainable use and conservation of biodiversity in the context of food and agriculture, including [those]\* **[targets]\*** developed by the Commission. Other global assessments, such as those undertaken by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), and reporting by countries on achievements in the implementation of their National Biodiversity Strategies and Action Plans (NBSAPs) to achieve the Convention on Biological Diversity’s (CBD’s) Aichi Biodiversity Targets, have increased awareness about biodiversity in general and its contributions to livelihoods and human well-being in particular.

3. In adopting its Multi-Year Programme of Work, the Commission, at its Eleventh Regular Session, decided to initiate a country-driven process for the preparation of *The State of the World’s Biodiversity for Food and Agriculture*. In 2013, FAO invited Member Countries to submit country reports on the state of their BFA. **[Ninety-one countries submitted reports.]\*** [At its Sixteenth Regular Session, in January 2017, the Commission requested FAO to finalize the Report in 2018.][**The State of the World’s Biodiversity for Food and Agriculture was published in February 2019.**]<sup>7</sup>

4. In the course of 2016, the Commission held informal regional consultations to share information on, and identify needs and possible actions for, the sustainable use and conservation of BFA. The needs and [possible] actions for the sustainable use and conservation of BFA identified in this document are [the result of]\* **[based on the outcomes of]\*** these regional consultations[, **global consultations and the findings of *The State of the World’s Biodiversity for Food and Agriculture*].\***

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<sup>6</sup> FAO. 1996. *The State of the World’s Plant Genetic Resources for Food and Agriculture*. Rome; FAO. 2007. *The State of the World’s Animal Genetic Resources for Food and Agriculture*. Rome; FAO. 2007. *The Global Plan of Action for Animal Genetic Resources and the Interlaken Declaration*. Rome; FAO. 2010. *The Second Report on the State of the World’s Plant Genetic Resources for Food and Agriculture*. Rome; FAO. 2011. *Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture*. Rome; FAO. 2014. *The State of the World’s Forest Genetic Resources*. Rome; FAO. 2014. *Global Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources*. Rome; FAO. 2015. *The Second Report on the State of World’s Animal Genetic Resources for Food and Agriculture*. Rome; FAO. [forthcoming] [2019]. *The State of the World’s Aquatic Genetic Resources for Food and Agriculture*. Rome.

<sup>7</sup> FAO. 2019. *The State of the World’s Biodiversity for Food and Agriculture*. Rome.]

5. This document identifies needs and [priority] **[possible]** actions for BFA, i.e. “the variety and variability of animals, plants and micro-organisms at the genetic, species and ecosystem levels that sustain the ecosystem structures, functions and processes in and around production systems, and that provide food and non-food agricultural products”.<sup>8</sup> “Production systems” are taken to include those in the crop, livestock, forest, fishery and aquaculture sectors. As per FAO’s definition, agriculture is inclusive of forestry, fisheries and aquaculture. [Further c]\*[C]oncepts used in the document are described, **in detail,**]\* in Annex 1.

## II. Rationale

### ORIGINAL TEXT:

6. [BFA, i.e. biodiversity that in one way or another contributes to agriculture and food production, is indispensable to food security and nutrition, sustainable development and the supply of many vital ecosystem services. Many countries have taken action to sustainably use and conserve, through various strategies, a range of plant, animal, forest and aquatic genetic resources. The Commission has provided and continues to provide guidance on the sustainable use and conservation of the various components of BFA through important, though mainly sector-specific, instruments and decisions. FAO monitors the implementation of these instruments and reports back to the Commission on their status of implementation and the status of the different sectors of genetic resources for food and agriculture (GRFA). However, there is a need for integrated management of the various components of BFA, going beyond sector-specific GRFA strategies and sustainably using and conserving BFA, including all GRFA, through more systematic approaches. Specific measures are needed in order to reverse the ongoing loss of BFA, improve its conservation and ensure its sustainable use through holistic and cross-sectoral management approaches, at genetic, species and ecosystem levels.]\*

### ALTERNATIVE TEXT:

**6. [BFA, i.e. biodiversity that in one way or another contributes to agriculture and food production, is indispensable to food security and nutrition, sustainable development and the supply of many vital ecosystem services. Many countries have taken action to sustainably use and conserve, through various strategies, a range of plant, animal, forest and aquatic genetic resources. The Commission has provided, and continues to provide, guidance on the sustainable use and conservation of components of BFA through various, mainly sector-specific, instruments and decisions, including the sectoral global plans of action. FAO monitors the implementation of these instruments and reports back to the Commission on the status of their implementation and the status of relevant categories of genetic resources for food and agriculture (GRFA). However, guidance on the management of components of BFA not covered by the sectoral global plans of action has so far been limited. There is also a need to go beyond sector-specific strategies and manage the various components of BFA, including all GRFA, in a more systematic and integrated way. Reversing the ongoing loss of BFA, ensuring its conservation and improving its sustainable use require holistic and cross-sectoral approaches that include actions at genetic, species and ecosystem levels.]\***

### ORIGINAL TEXT WITH PROPOSED AMENDMENTS:

7. [Key features of BFA **[and its management]**]\* include the following:

*Important components of BFA*<sup>9</sup>

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<sup>8</sup> [FAO. 2013. *Guidelines for the preparation of the country reports for The State of the World’s Biodiversity for Food and Agriculture*. Rome.]\* [FAO. 2019. *The State of the World’s Biodiversity for Food and Agriculture*. Rome.]\*

<sup>9</sup> See Annex 1 for descriptions of concepts used in this document.]

- GRFA are a key component of BFA. Knowledge of the characteristics, population status, breeding for sustainable use and conservation of GRFA exists – for example, of crop varieties, livestock breeds, tree and other woody plant species, aquatic strains and species, micro-organisms and invertebrates, i.e. those directly used in the various sectors – although with regional and sectoral differences.
- Associated biodiversity is another component of BFA and is essential to the supply of many ecosystem services that underpin food and agricultural production. Components of associated biodiversity, for example pollinators, soil and aquatic organisms and the natural enemies of pest species in and around crop, livestock, forest and aquatic production systems, play a significant role in maintaining or increasing biodiversity within these systems, thus strengthening rural livelihoods, improving food security and nutrition and enhancing sustainability and resilience in the face of challenges such as climate change.
- The wild foods component of BFA encompasses those that contribute to major economic sectors such as capture fisheries, and a wide range of other, mostly locally harvested, fungi, plants and animals, including invertebrates. They are important for food security and nutrition in many countries, yet are increasingly at risk of loss. Wild species harvested as sources of food are an important, but often overlooked, component of biodiversity in and around production systems. [Some wild foods are] **[Some wild foods, including wildlife taken for bushmeat as well as wild plant and animal species taken for commercial purposes such as medicine, can be traded across long distances and this often has negative impacts on wildlife populations and habitats. Wild foods can also be]** relatives of domesticated species, have potential for domestication and provide a pool of genetic resources for hybridization and selection.

#### *Assessment and monitoring*

- Knowledge of the state of associated biodiversity, ecosystem services and wild foods varies from region to region and is often incomplete. Many invertebrates and micro-organisms, as well as some plant and other animal species, found in and around production systems, have not been recorded or characterized, and their functions within ecosystems remain poorly understood.
- The underdeveloped state of monitoring programmes for associated biodiversity and wild foods means that data on their status and trends are [inevitably]\* patchy. Population surveys and proxy measures provide an indication of the status of individual categories of associated biodiversity at local, national or regional levels. Data of this kind present a mixed picture, but there are many [grounds] **[reasons]** for concern about the decline of key components of associated biodiversity.]

#### *Drivers of change*

- Associated biodiversity and the ecosystem services it delivers are being affected, often negatively, by a range of drivers. Yet they can also serve as a source of resilience to the effects of many of these drivers and as a basis for the adaptation of production systems to current and future challenges. Drivers range from local to global in scale and from developments in technology and management practices within the food and agriculture sector to wider environmental, economic, social, cultural and political factors.

#### *Legal and policy frameworks*

- Most countries have put in place policy and legal frameworks targeting the sustainable use and conservation of biodiversity as a whole, and many have nature-protection measures in place for wild biodiversity, often complemented by specific policies for specific GRFA, or they may integrate GRFA into [sectoral or rural development policies] **[policies for specific sectors of food and agriculture, food and agriculture in general or rural development]**. Policies addressing the management of food and agricultural production systems are increasingly based on ecosystem, landscape and seascape approaches. However, [these]\* legal and policy frameworks often lack a specific focus on associated

biodiversity or wild foods. While national and international agreements are in place to reduce overexploitation of captured fish species or forests, legal and policy measures explicitly targeting other wild foods or components of associated biodiversity and their roles in supplying ecosystem services are not [widely reported]\* **[widespread]\***.

- A number of obstacles constrain the development and implementation of effective policies addressing the sustainable use and conservation of BFA, and of associated biodiversity in particular. Implementation is sometimes hampered by a lack of human and financial resources, a lack of awareness and knowledge on the part of stakeholders, a lack of political will and/or governance and a lack of cooperation among relevant agencies.

#### *Management and cooperation*

- Efforts to manage BFA, especially associated biodiversity, to promote the supply of regulating and supporting ecosystem services are widely reported.
- The use of a range of management practices regarded as favourable to the sustainable use and conservation of BFA is reported to be increasing. However, knowledge of how these practices influence the status of BFA still needs to be improved.
- Sustainable management of BFA and promotion of its role in the supply of ecosystem services require multistakeholder, [cross-sectoral and international cooperation] **[cooperation across the sectors of food and agriculture and between the food and agriculture sector and the environment/nature conservation sector and other relevant sectors at local, national and regional and global levels]**. The use of BFA spans international borders and the conventional boundaries between sectors. Frameworks for cooperation at national, regional and international levels in the management of genetic resources are relatively well developed in the individual sectors of food and agriculture.]

#### ALTERNATIVE TEXT:

7. **Key findings of the report on *The State of the World's Biodiversity for Food and Agriculture* include the following<sup>10</sup>:**

#### ***Biodiversity is essential to food and agriculture***

- **Plant, animal and aquatic genetic resources for food and agriculture and forest genetic resources – and their diversity at species, within-species (variety, breed, strain, etc.) and genetic levels – are vital to the current and future productivity and resilience of the crop, livestock, forest, aquaculture and fisheries sectors. Wild relatives of domesticated species have potential for domestication and provide a pool of genetic resources for hybridization and selection.**
- **Associated biodiversity – including invertebrate and micro-organism genetic resources – present in and around production systems is essential to the supply of many ecosystem services that underpin agriculture and food production, including pollination, control of pests, maintenance of soil fertility, carbon sequestration and regulation of water supplies.**
- **Wild foods – a wide range of fungi, plants and animals, including invertebrates – are important for food security and nutrition in many countries. They are often harvested and consumed locally, but are also traded over long distances. In the case of capture fisheries, they form the basis of a major sector of food and agriculture.**

#### ***Biodiversity for food and agriculture is declining***

- **Many key components of BFA at genetic, species and ecosystem levels are in decline.**

<sup>10</sup> [FAO, 2019. *The State of the World's Biodiversity for Food and Agriculture – In brief*. Rome.]

- Knowledge of the state of associated biodiversity, ecosystem services and wild foods varies from region to region and is often incomplete. Many invertebrate and micro-organism species, as well as some plant and other animal species, found in and around production systems, have not been recorded or characterized, and their functions within ecosystems remain poorly understood.
- The underdeveloped state of monitoring programmes for associated biodiversity and wild foods means that data on their status and trends are patchy. Population surveys and proxy measures provide an indication of the status of individual categories of associated biodiversity at local, national or regional levels. Data of this kind present a mixed picture, but there are many reasons for concern about the decline of key components of associated biodiversity.
- Information on the status and trends of plant, animal, aquatic genetic resources for food and agriculture and forest genetic resources is more complete. However, many knowledge gaps remain, particularly in the developing regions of the world.

*Multiple interacting drivers of change are affecting biodiversity for food and agriculture*

- BFA and the ecosystem services it delivers are being affected, often negatively, by a variety of drivers, ranging from local to global in scale and from developments in technology and management practices within the food and agriculture sector to wider environmental, economic, social, cultural and political factors. More specifically, global trends such as changes in climate, international markets and demography are giving rise to drivers at production-system level such as land-use change, inappropriate use of external inputs, overharvesting and proliferation of invasive species. The category of driver mentioned by the highest number of countries as having negative effects on BFA was changes in land and water use and management. In contrast, reporting countries tended to view policy measures and advances in science and technology as positive drivers that offer ways of reducing the negative effects of other drivers on BFA. Both provide potential entry points for interventions supporting sustainable use and conservation.

*The use of many biodiversity-friendly practices is reported to be increasing*

- Efforts to manage BFA, especially associated biodiversity, to promote the supply of regulating and supporting ecosystem services are widely reported.
- The use of a wide range of management practices and approaches regarded as favourable to the sustainable use and conservation of biodiversity for food and agriculture is reported to be increasing. However, knowledge of how these practices influence the status of BFA still needs to be improved.
- Although efforts to conserve biodiversity for food and agriculture *in situ* and *ex situ* are increasing, levels of coverage and protection are often inadequate.

*Enabling frameworks for the sustainable use and conservation of biodiversity for food and agriculture remain insufficient*

- Most countries have put in place policy and legal frameworks targeting the sustainable use and conservation of biodiversity as a whole, and many have nature-protection measures in place for wild biodiversity, often complemented by specific policies for specific GRFA, or they may integrate GRFA into policies for specific sectors of food and agriculture, food and agriculture in general or rural development. Policies addressing the management of food and agricultural production systems are increasingly based on ecosystem, landscape and seascape approaches. However, legal and policy frameworks often lack a specific focus on associated biodiversity or wild foods. While national and international agreements are in place to reduce overexploitation of captured fish species or forests, legal and policy measures explicitly targeting other wild foods or components of associated biodiversity and their roles in supplying ecosystem services are not widespread.

- **Sustainable management of BFA and promotion of its role in the supply of ecosystem services require multistakeholder cooperation across the sectors of food and agriculture and between the food and agriculture sector and the environment/nature conservation sector and other relevant sectors at local, national and regional and global levels. The use of BFA spans international borders and the conventional boundaries between sectors. Frameworks for cooperation at national, regional and international levels in the management of genetic resources are relatively well developed in the individual sectors of food and agriculture.**
- **A number of obstacles constrain the development and implementation of effective policies addressing the sustainable use and conservation of BFA, and of associated biodiversity in particular. Implementation is sometimes hampered by a lack of human and financial resources, a lack of awareness and knowledge on the part of stakeholders, a lack of political will and/or governance and a lack of cooperation among relevant agencies.]**

ORIGINAL TEXT:

8. [The sustainable use and conservation of BFA face several challenges. For example, BFA covers many fields and sectors – ranging from GRFA to associated biodiversity, such as pollinators and soil micro-organisms, to habitats and ecosystems – that cannot be managed in isolation. Among the challenges reported by countries is the need to put in place cross-sectoral collaboration and cooperation mechanisms to manage BFA effectively.]

ALTERNATIVE TEXT:

**8. [The sustainable use and conservation of BFA face numerous challenges. For example, components of BFA often contribute to the supply of several different ecosystem services on a range of scales and hence contribute directly and indirectly to the livelihoods and well-being of many different people across a variety of stakeholder groups, both within and beyond the food and agriculture sector. Components of BFA influence each other through a variety of different mechanisms – some of which are deliberately mediated through human management and many of which are affected inadvertently by human actions – again on a range of different scales. BFA therefore cannot be managed effectively if its components are considered in isolation from each other. Cross-sectoral and multistakeholder cooperation mechanisms that address multiple components of BFA are thus vital.]**

9. The Commission's sectoral global plans of action set out strategic priorities for the sustainable use, development and conservation of GRFA, as well as provisions related to collaboration, financing and implementation. The Commission guides, supports and monitors the implementation of the sectoral global plans of action and assesses, at regular intervals, the status of their implementation and of the respective components of GRFA.

10. The needs and [possible] actions [compiled]\***[contained]\*** in this document reflect the challenges **[and potential responses]\*** identified by countries during the preparation of *The State of the World's Biodiversity for Food and Agriculture*. A strong emphasis is placed on actions that seek to further improve knowledge of BFA, in particular of [the species and ecosystem-level components, for example associated biodiversity,]\* **[components, such as associated biodiversity and wild foods,]\*** that lag behind others in this respect, and of the impacts of management practices and approaches on BFA. Also stressed is the need to implement practical approaches and actions to improve the management of BFA. Even greater emphasis is given to the importance of cooperation and collaboration, at all levels, in the sustainable use and conservation of BFA.

ORIGINAL TEXT WITH PROPOSED AMENDMENTS:

11. [Recognizing the importance of avoiding duplication, and the need for collaboration and coordination, this document provides an overarching framework for the sustainable use and conservation of BFA as a whole. Action should be taken by countries in accordance with their national priorities and international commitments, as appropriate. The document neither changes, nor replaces, the Commission's existing sectoral global plans of action. Instead, it complements them and creates an overall enabling framework for their consistent and coherent implementation. [Also, in view of the cross-sectoral work of the Commission on access and benefit-sharing for GRFA, the document does not refer to access and benefit-sharing issues.]

### III. Nature of the document

12. This document aims to promote coordinated action across sectors relevant to BFA at genetic, species and ecosystem levels. It is voluntary and non-binding. It does not aim to replace or duplicate the sectoral global plans of action for GRFA, or other international agreements, but to strengthen their harmonious implementation, as applicable. The document should be updated as and when required.]

#### ALTERNATIVE TEXT:

### 3. [Nature of the document

11. **Recognizing the importance of avoiding duplication, this document aims to provide a framework for the management of BFA as a whole and to promote coordinated action across all the sectors of food and agriculture – and more widely – to improve the sustainable use and conservation of BFA at genetic, species and ecosystem levels. It is voluntary and non-binding. It is not intended to replace, duplicate or change the Commission's existing sectoral global plans of action for GRFA, or other international agreements, but to strengthen their harmonious implementation, as applicable. It should be updated as and when required. Action should be taken by countries in accordance with their national priorities and international commitments, as appropriate.]**

### IV. Objectives

13. [With regard to BFA, especially associated biodiversity, and the regulating and supporting ecosystem services it underpins, the actions contained in t]\* [T]\*his document aim[s]\* to:

- **[contribute to the achievement of the SDGs and the implementation of the CBD's post-2020 global biodiversity framework;]**
- raise awareness of the importance of BFA[, **in particular associated biodiversity and wild foods, and the ecosystem services it provides]**\* among all stakeholders[ involved]\*, from producers to consumers and policy-makers;
- create [an enabling] [**a contextual**] framework for the coherent and consistent implementation of the Commission's [existing]\* sectoral global plans of action and for the sustainable use and conservation of associated biodiversity and wild foods and thus for the conservation of all BFA, as a basis for food security[ **and nutrition]**\*, sustainable food and agriculture, and poverty reduction;
- promote the sustainable use and conservation of BFA, in particular associated biodiversity and wild foods, within production systems and terrestrial and aquatic ecosystems, as a basis for ecosystem services and resilience, in order to foster economic development and reduce hunger and poverty, particularly in developing countries, as well as to provide options for adapting to and mitigating climate change;
- set the conceptual basis [and framework] for the development and adoption of national policies, legislation and programmes for the sustainable use and conservation of BFA;

- increase national, regional and international cross-sectoral cooperation and information-sharing and enhance institutional capacity, including in research, education and training [***inter alia* university outreach programmes and action-oriented research programmes fostering cross-cultural co-production of biodiversity-related knowledge between scientists and the holders of indigenous and local traditional knowledge**] on the sustainable use and conservation of BFA;
- improve data collection and the development of metrics and indicators to measure the impact of management practices and approaches on the sustainable use and conservation of BFA at genetic, species and ecosystem levels; [and]\*
- reduce unintended and unnecessary duplication of actions in order to promote efficiency and effectiveness in global, regional and national efforts to sustainably use and conserve BFA[.]; and]
- [provide guidance to FAO's work on the provision of support to countries in their efforts to strengthen the sustainable use and conservation of BFA, including in the context of its Strategy on Mainstreaming Biodiversity across Agricultural Sectors.<sup>11</sup>]

[13. bis It should be borne in mind that the actions will need to be implemented in a wide range of different circumstances. Implementation will need to account for variation in the characteristics of production systems and components of BFA, in the needs of producers and other stakeholders and in the capacity and resources available. It should also be noted that while some actions may be rapidly realizable, implementing others may require more time to implement.]

#### ADDITIONAL TEXT:

#### [4. bis Operative principles

13. Across all [strategic] priority areas, the implementation of the [possible] actions contained in this document should be guided by the following operative principles:

- The implementation of [possible] actions should be based on sound scientific evidence. Where relevant, indigenous and local traditional knowledge should be taken into consideration. Participatory research approaches, should be utilized, as appropriate, including where relevant approaches based on cross-cultural co-production of knowledge.
- The [possible] actions are intended for implementation, as appropriate, in all types of production system and in countries at all levels of development. Where relevant, special attention should be given to the needs of smallholder agriculture, forestry, fisheries and aquaculture.
- The implementation of the [possible] actions should, where relevant, take into consideration the particular roles of women as managers of BFA and holders of BFA-related knowledge. The effective participation of women in the implementation of all [possible] actions should be ensured.
- The implementation of the [possible] actions should, where relevant, take into consideration the particular roles of indigenous peoples and local communities as managers of BFA and holders of BFA-related knowledge. The effective participation of indigenous peoples and local communities in the implementation of all [possible] actions should be ensured]

## V. Structure and organization

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[<sup>11</sup> CL 163/11 Rev.1]

14. The document presents a set of integrated and interlinked [possible] actions, organized into three **[strategic]** priority areas, for the sustainable use and conservation of BFA. Many of these [possible] actions are relevant to more than one **[strategic]** priority area.

**[Strategic]** Priority Area 1: Assessment and monitoring of biodiversity for food and agriculture

**[Strategic]** Priority Area 2: Management of biodiversity for food and agriculture **[with the objective of combating the global syndemic of obesity, undernutrition and climate change]**

**[Strategic]** Priority Area 3: Institutional frameworks for biodiversity for food and agriculture

15. The [possible] actions are not listed in order of priority, as the relative priority of each [area for]\*[possible] action and associated timelines may vary significantly across countries and regions. Relative priority may depend on [the components of BFA themselves, the natural environment or production systems involved, current management capacities, financial resources or policies already underway for the management of BFA]\* **[the components of BFA, environments or production systems involved or on the current state of capacities, financial resources or policies for the management of BFA]\*.**

16. For each [area of [possible] action]\* **[[strategic] priority area]\***, an introduction presents the needs identified on the basis of the country reports prepared as contributions to the [Report]\***[The State of the World's Biodiversity for Food and Agriculture]\*** and the consultative processes described above. A number of specific priorities are then presented. Each priority consists of a rationale and a set of individual [possible] actions.

**[STRATEGIC] PRIORITY AREAS FOR THE SUSTAINABLE USE AND CONSERVATION OF BIODIVERSITY FOR FOOD AND AGRICULTURE**

**[STRATEGIC] PRIORITY AREA 1: ASSESSMENT AND MONITORING OF BIODIVERSITY FOR FOOD AND AGRICULTURE**

1.1 Improve availability of, and access to, information on biodiversity for food and agriculture

**[STRATEGIC] PRIORITY AREA 2: MANAGEMENT OF BIODIVERSITY FOR FOOD AND AGRICULTURE [WITH THE OBJECTIVE OF COMBATING THE GLOBAL SYNDROMIC OF OBESITY, UNDERNUTRITION AND CLIMATE CHANGE]**

2.1 Promote integrated approaches to the management of biodiversity for food and agriculture

2.2 Improve conservation of biodiversity for food and agriculture **[and the knowledge that enables such conservation]**

**[STRATEGIC] PRIORITY AREA 3: INSTITUTIONAL FRAMEWORKS FOR BIODIVERSITY FOR FOOD AND AGRICULTURE**

3.1 [Build capacity through awareness raising, research, education and training] **[Build capacity through awareness raising, research, education, training, university outreach and science–traditional knowledge cross-cultural knowledge co-production]**

3.2 Strengthen legal, policy and incentive frameworks

3.3 [Cooperation and funding]\* **[Improve cooperation and funding]\***

## **[STRATEGIC] PRIORITY AREA 1: ASSESSMENT AND MONITORING OF BIODIVERSITY FOR FOOD AND AGRICULTURE**

### **Introduction**

The [identification, characterization,]\* assessment and monitoring of BFA [(see Annex 1 for concepts used in this document)]\* are essential to its sustainable use and conservation. The assessment and monitoring of the state and trends of BFA and of its management, at national, regional and global levels, are uneven and often limited and partial. The extent and character of existing knowledge gaps also vary significantly across the various categories of BFA.

In the case of domesticated plant, animal and aquatic GRFA – and of species that are widely harvested from the wild (e.g. forest trees and other woody plant species and species [in]\* **[targeted by]\*** capture fisheries) – inventories and **[other]\*** information exist, although to varying degrees across the regions of the world and across [sectors] **[the sectors of food and agriculture]**. At global level, monitoring systems for GRFA have been developed, for example the World Information and Early Warning System on Plant Genetic Resources for Food and Agriculture (WIEWS), the Domestic Animal Diversity Information System (DAD-IS) and the FAO [Worldwide Information System on Forest Genetic Resources (ReforGen)]\***[global information system on forest genetic resources]\***.

### ORIGINAL TEXT:

[Monitoring of major ecosystems of importance to food and agriculture is generally conducted at national, regional and global levels for inland and coastal wetlands, coral reefs, mangroves, seagrass beds, forests and rangelands, although at varying levels of comprehensiveness.]

### ALTERNATIVE TEXT:

**[Major ecosystem categories of importance to food and agriculture, for example inland wetlands, coral reefs, mangroves, seagrass beds, forests and rangelands, are monitored at national, regional and global levels, although at varying levels of comprehensiveness.]\***

In contrast, many associated biodiversity species that provide regulating and supporting ecosystem services, particularly micro-organisms and invertebrates, have not been identified and documented. Population trends are relatively well [documented] **[known]** for some taxonomic groups (such as some vertebrates) but, for others, knowledge is almost non-existent. In many cases, characterization and systematization of individual species are very difficult, and metagenomics and other “omics” methods can be used to identify assemblages.

**[There are also many gaps in knowledge on the characteristics and the status and trends of species that are sources of wild foods.]**

In many cases, the contributions of specific components of BFA to the supply of ecosystem services are poorly understood[, as are the effects of particular drivers [(including climate change)]] on population sizes and distributions and on the ecological relationships that underpin the supply of ecosystem services.

In view of the above, there is an overall need to improve the availability of data and information. More specific needs include improving methodologies for recording, storing and analysing data [(including geographic information systems)] **[(including spatial data)]** on changes in the abundance and distribution of species and ecosystems and improving capacity for monitoring and assessment, for example by increasing the number of skilled taxonomists.

**Priority 1.1 Improve availability of, and access to, information on biodiversity for food and agriculture**

## Rationale

### ORIGINAL TEXT WITH PROPOSED AMENDMENT:

[BFA is composed of a myriad of species, and within them of populations, varieties, breeds and strains. Recognizing the central importance of GRFA, and of their characterization, assessment and monitoring, provisions for these actions have been agreed in the sectoral global plans of actions for the respective genetic resources.

There is a need to improve knowledge of other species of importance to food and agriculture, for example associated biodiversity providing pollination and pest and disease regulation services and wild foods, as well as entire ecosystems and habitats, building on and strengthening existing data where possible. Given the wide scope of these components of BFA and variations in the needs and capacities of countries, priority species, ecosystems or ecosystem services for assessment and monitoring need to be established at national level. **[Where possible, efforts need to be made to promote synergies in assessment and monitoring activities for the various components of BFA, including those covered by the sectoral global plans of action.]**

A wide range of management practices and approaches exist that make use of various components of BFA and are thus considered to contribute to its maintenance and enhanced use. Such practices and approaches include those used at production level (e.g. conservation agriculture, pollination management, organic agriculture and integrated pest management), mixed production systems (e.g. agroforestry, integrated crop–livestock–aquatic systems and diversification practices in aquaculture), restoration practices, and approaches at terrestrial and aquatic ecosystem level (e.g. ecosystem approaches to fisheries and aquaculture, sustainable forest management and agroecology). However, in most cases, it is difficult to evaluate the extent to which these are being used, owing to the variety of scales and contexts involved and the absence of information on the application of practices. Although the impacts of BFA-focused practices on BFA are generally perceived to be positive, there is clearly a need for more research and for the development of appropriate assessment methods in this regard.]

### ALTERNATIVE TEXT:

**[The sectoral global plans of actions include provisions for the assessment and monitoring of the respective categories of GRFA. However, there is a need to improve knowledge of other components of BFA, for example associated biodiversity and wild foods, at genetic, species and ecosystem levels, as relevant, and their roles in the supply of ecosystem services, building on existing data where possible. Given that each country has its own set of circumstances, needs and capacities, priority species, ecosystems or ecosystem services for assessment and monitoring need to be established at national level. Where possible, efforts need to be made to promote synergies in assessment and monitoring activities for the various components of BFA, including those covered by the sectoral global plans of action.]**

**A wide range of management practices and approaches make use of components of BFA in a sustainable way and thus potentially contribute to their conservation.<sup>12</sup> These include specific production practices and approaches (e.g. conservation agriculture, pollination management, organic agriculture and integrated pest management), the use of mixed production systems (e.g. agroforestry and integrated crop–livestock–aquatic systems), restoration practices, and integrated approaches at ecosystem level (e.g. ecosystem approaches to fisheries and aquaculture, sustainable forest management and agroecology). In most cases, it is difficult to evaluate the extent to which such practices and approaches are being used, owing to the variety of scales and contexts involved and the absence of relevant data. Although impacts on BFA are generally perceived to be positive, there is a need for more research and for the development of appropriate assessment methods in this regard.]**

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<sup>12</sup> See Chapter 5 of FAO. 2019. *The State of the World's Biodiversity for Food and Agriculture*. Rome for a description of the status and trends in the adoption of over 20 such practices and approaches.]

## **[Possible] Actions**

### *[Genetic resources for food and agriculture]*

1.1.1 Promote the implementation[, **at all levels,**] of the sectoral global plans of action to improve [characterization,]\* assessment and monitoring [of the respective genetic resources], as appropriate.

**[1.1.1 bis In implementing activities related to the assessment and monitoring of BFA, including in the implementation of the sectoral global plans of action, ensure, to the extent possible, that interactions between the sectors of food and agriculture are taken into account and that synergies are promoted and duplication of efforts minimized.]**

### ORIGINAL TEXT SHOWING PROPOSED AMENDMENTS:

### *[[Associated biodiversity], **wild foods,**] and ecosystem services]*

1.1.2 Improve understanding of [the effects of particular drivers (including climate change) on population sizes and distributions of associated biodiversity] [**drivers of change and their effects on associated biodiversity and wild foods, including on population sizes and distributions,**] and on the ecological relationships that underpin the supply of ecosystem services.

**[1.1.2 bis Improve understanding of associated biodiversity and wild foods by establishing or strengthening assessment and monitoring programmes for these components of BFA.]**

**[1.1.2 ter For all components of BFA, take action to reduce knowledge gaps on their roles in the supply of ecosystem services, including on how these roles are influenced by management practices in the food and agriculture sector. Monitor relevant ecosystems for changes in the supply of ecosystem services over time.]**

**[1.1.2 quater For all relevant components of BFA, take action to reduce gaps in knowledge on their nutritional contents and their potential significance in efforts to improve food security and nutrition, including gaps in knowledge related to cultural and social aspects of their use.]**

1.1.3 Identify priority species [**of associated biodiversity and wild foods**], ecosystems and ecosystem services, as relevant, for assessment and monitoring at national level.

[1.1.4 Identify responsibilities for assessment and monitoring of associated biodiversity [and their ecosystem services] [**and the ecosystem services it provides and of wild foods and their consumption and use**]. This could involve mandating a national agency (e.g. from the agriculture or environment sectors [or both] [**or an intersectoral agency**]) to collect data and undertake monitoring activities.]

[1.1.5 Use, to the extent feasible,] [**Evaluate the relevance and applicability of**] existing monitoring systems (e.g. those developed for the SDGs, CBD or the Commission) [**for use at regional level**] and existing data and indicators at national level and explore the potential of indicators [that serve multiple purposes] [**that draw on these monitoring systems for verification purposes and are used for decision-making at regional and national levels.**]

[1.1.6 Taking into account relevant international initiatives and existing tools and methodologies, strengthen existing and/or develop new tools, standards and protocols for [data collection, inventory,]\* assessment and monitoring [**of BFA**]\*.]

[1.1.7 Integrate existing national monitoring systems [**on BFA**] (e.g. those developed for the SDGs, CBD or the Commission) [into an overarching [**global**] framework for BFA], with a view to improving the assessment and monitoring of BFA by making full use of all existing data and indicators at national level.]]

### *[Integrated management]*

[1.1.8 Develop tools for data collection and methodology for their analysis, knowledge-management systems and methods for exchange and dissemination of BFA-related knowledge, including on its

integrated management, in a participatory way[, or promote the use of existing tools and methods, where available and appropriate][, with the active collaboration of the relevant national authorities].]

1.1.9 Improve the [[collection and] availability of the data needed to monitor] [monitoring of] [how BFA is being managed, including of] the extent to which management practices and approaches [contributing to the sustainable use and conservation of BFA] are being [used,] [adopted,] [taking into account traditional knowledge] [taking into account local production systems].

[1.1.9 bis Support, including via funding, existing national and/or international biodiversity information systems to further expand and integrate specific modules on BFA, its use and associated traditional knowledge.]

[1.1.9 ter Establish, at national level, participatory joint monitoring systems on food, agriculture and biodiversity as permanent contributors of citizen-science knowledge.]

[1.1.9 quater Effectively disseminate information on, and develop capacity to use, at national level, the various evaluation and monitoring systems that exist for BFA.]

1.1.10 Develop and apply methods, including proxies, to assess the impact of management practices on BFA and the provision of ecosystem services.

[1.1.11 Develop international reference tools for assessment and monitoring of BFA.]]

ALTERNATIVE TEXT:

[1.1.2 Improve the inventory and characterization of associated biodiversity and wild foods. Monitor changes in their populations and distributions over time.

1.1.3 Improve the assessment of how BFA, in particular associated biodiversity and wild foods, is being managed, including of the extent to which management practices and approaches contributing to its sustainable use and conservation are being adopted, taking into account traditional knowledge, as relevant, and the characteristics of local production systems. Monitor changes in levels of adoption of relevant management practices over time.

1.1.4 Improve the assessment of drivers of change and their effects on BFA, in particular associated biodiversity and wild foods, including on population sizes and distributions, and on the ecological relationships that underpin the supply of ecosystem services. Monitor changes in relevant drivers over time.

1.1.5 For all components of BFA, take action to reduce knowledge gaps on their roles in the supply of ecosystem services, including on how these roles are influenced by management practices in the food and agriculture sector. Monitor relevant ecosystems for changes in the supply of ecosystem services over time.

1.1.6 For all relevant components of BFA, take action to reduce gaps in knowledge on their nutritional contents and their potential significance in efforts to improve food security and nutrition, including gaps in knowledge related to cultural and social aspects of their use. Monitor changes in consumption over time.

1.1.7 Assign responsibilities for the assessment and monitoring of associated biodiversity and wild foods. This could involve mandating a national agency (e.g. from the agriculture or environment sectors or an intersectoral agency) to undertake, or to coordinate and oversee, monitoring activities.

1.1.8. As relevant, identify priority species, ecosystems and ecosystem services for assessment and monitoring at national level.

1.1.9 For aspects of the assessment and monitoring of BFA, strengthen involvement of citizen scientists, as appropriate.

**1.1.10 In strengthening assessment and monitoring programmes for BFA, use and integrate – as relevant, and to the extent feasible – existing assessment and monitoring systems (e.g. those developed for the SDGs, CBD or the Commission), and existing data and indicators, at national, regional and global levels and explore the potential of indicators that serve multiple purposes.**

**1.1.11 Taking into account relevant international initiatives and existing tools and methodologies, strengthen existing and/or develop new tools, standards and protocols for the assessment and monitoring of BFA, including for participatory approaches, for use at national and/or international levels, as appropriate. These should include methods, including proxies, for assessing the impact of management practices on BFA and the provision of ecosystem services.**

**1.1.12 Support, including via funding, the improvement of information systems for BFA, and in particular associated biodiversity and wild foods, including by establishing or further developing specific modules on BFA, its use and associated traditional knowledge within existing national and international information systems.**

**1.1.13 Strengthen capacity to use assessment and monitoring systems, including by improving the dissemination of information to users.]**

**[STRATEGIC] PRIORITY AREA 2: MANAGEMENT OF BIODIVERSITY FOR FOOD AND AGRICULTURE [WITH THE OBJECTIVE OF COMBATING THE GLOBAL SYNDemic OF OBESITY, UNDERNUTRITION AND CLIMATE CHANGE]**

ORIGINAL TEXT WITH PROPOSED AMENDMENTS:

**[Introduction**

Managing the capacity of BFA to supply [various] **[food, agricultural and]** ecosystem services involves a range of activities at a range of levels (from genetic and species to landscape or seascape levels). These activities involve the sustainable use and the conservation of BFA.

In the case of BFA, “use” includes the various practices and activities involved in cultivating or raising domesticated species, the implementation of formal or informal genetic-improvement activities and the domestication of additional wild species, the introduction of domesticated or wild species into new production systems, the management of wild species and associated biodiversity and their habitats in and around production systems to promote the delivery of ecosystem services, and the harvesting of food and other products from the wild.

The term “sustainable use” applied to associated biodiversity involves two main areas: (a) the management *in situ* of all BFA to maintain the diversity of organisms and their interactions to ensure the continued provision of ecosystem services, and (b) the targeted domestication and selection of species to improve the delivery of ecosystem services **[and food production]**. It is widely acknowledged that the management of diversity, including habitats for associated biodiversity species, contributes to building resilient production systems and livelihoods, promoting food security and nutrition and sustainably intensifying food and agricultural production. With a few exceptions, selection and genetic improvement do not focus on associated biodiversity species.

Numerous management practices and approaches applied at farm, tree-stand or other production unit level, or at ecosystem, land or seascape levels, are [considered] **[perceived]** to be of positive influence on the sustainable use and conservation of BFA. At the same time, the principal drivers of change at production-system level that negatively impact BFA and associated ecosystem services are related to management practices, including changes in land and water use and management, pollution and **[over][unsustainable ]**use of external inputs, and **[over][unsustainable ]**exploitation and **[over]** harvesting of resources. The development, adoption and implementation of BFA-focused practices and approaches, and the mitigation and avoidance of negative ones, face several challenges. For one, while each component of BFA – from individual genes and species of plants, animals and micro-organisms to entire ecosystems – is important, it does not exist in isolation and must, therefore, be managed as part of the wider landscape or seascape. This requires, *inter alia*, bringing together and engaging the diverse stakeholders operating within the respective landscape or seascape.

Other priorities for the management of BFA could include:

i) promoting activities to strengthen and maintain traditional knowledge that contributes to the sustainable management of BFA. Much knowledge has already been lost without ever having been documented, and this loss is ongoing as the use of traditional practices dwindles;

ii) maintaining areas of natural or semi-natural habitat within and around production systems, including those that are intensively managed, where necessary restoring or reconnecting damaged or fragmented habitats;

iii) addressing specific threats **[to BFA]** such as invasive alien species or **[particular]** unsustainable practices in agriculture, forestry, fisheries[, ] **[or]** aquaculture **[or use of wild foods]**; and

iv) promoting and expanding the development, adoption and implementation of ecosystem or landscape/seascape approaches[, **social perspectives and other approaches countries may consider**

**appropriate]** in the management of production systems to ensure the supply of ecosystem services and improve livelihoods.

In the context of BFA, *in situ* conservation comprises measures that promote the maintenance and continued evolution of biodiversity in and around crop, livestock, forest, aquatic and mixed production systems. *Ex situ* conservation comprises the conservation of components of BFA outside their normal habitats in and around production systems. This may involve the maintenance of live organisms at sites such as botanical gardens, *ex situ* stands, aquaria, field gene banks, zoos or rarebreed farms, or storage of seeds, pollen or vegetative plant tissues or cryoconserved materials, such as animal semen or embryos, in genebanks.

Priorities for the conservation of GRFA have been agreed by the Commission in the sectoral global plans of action. In general, *ex situ* conservation has made progress in the past decade in all sectors of GRFA, while *in situ* and on-farm conservation face greater challenges, including those related to economic drivers.

In view of the above, inadequate funding and a lack of trained personnel are common resource constraints, as is a lack of technical resources. Where human resources are concerned, weaknesses are particularly noticeable in taxonomy and systematics. The lack of an interdisciplinary approach in research hampers efforts to improve conservation methods and strategies. A lack of resources makes it more difficult to bridge knowledge gaps of the kind described above, and constrains programme implementation or prevents effective enforcement of regulations **[and policies]** aimed at protecting biodiversity. Conservation-related education, training and awareness-raising activities for stakeholders at all levels from producers to policy-makers need to be strengthened.

The other main category of constraints comprises weaknesses in legal, policy and institutional frameworks and/or their implementation. The provision of regulating and supporting ecosystem services and the conservation of the associated biodiversity that underpins them are not sufficiently mainstreamed into policies targeting the various sectors of food and agriculture and those addressing other sectors of the economy. There is also limited focus on associated biodiversity in general biodiversity-related policy frameworks. In countries that have developed relevant policies and laws, these are often not properly implemented.

Lack of collaboration and coordination between stakeholders is another widely recognized constraint. Generally, there is a lack of cross-sectoral coordination, including at policy level. There are constraints associated with a lack of adequate links between ministries, between researchers and policy-makers and between policy-makers and producers or local communities.]

#### ALTERNATIVE TEXT:

##### **[Introduction**

**Management of BFA is taken here to comprise the various activities involved in its use and its conservation *in situ* and *ex situ*.**

**Use of BFA includes the cultivation or raising of domesticated species, the implementation of formal or informal genetic-improvement activities and the domestication of additional wild species, the introduction of domesticated or wild species into new production systems, the management of associated biodiversity in and around production systems to promote the delivery of ecosystem services, and the harvesting of food and other products from the wild. Some of these practices and approaches contribute to the maintenance of BFA, while others are major drivers of its loss, including via damaging changes in land and water use and management, pollution, unsustainable use of external inputs, and unsustainable exploitation and harvesting. The implementation of a number of management practices and approaches perceived (based on varying levels of evidence) to be biodiversity-friendly (for instance,**

agroforestry, conservation agriculture and organic production) is reported to be increasing globally.<sup>13</sup>

*In situ* conservation of BFA comprises measures taken to promote the maintenance and continued evolution of biodiversity in and around crop, livestock, forest, aquatic and mixed production systems. *Ex situ* conservation comprises the maintenance of components of BFA outside their normal habitats in and around production systems. This may involve the maintenance of live organisms at sites such as botanical gardens, *ex situ* tree stands, aquaria, field genebanks, zoos or rare-breed farms, or storage of seeds, pollen or vegetative plant tissues or cryoconserved materials, such as animal semen or embryos, in genebanks.

Managing BFA more sustainably will require efforts to address threats and build on opportunities associated with a wide range of interacting drivers of change.

The sectoral global plans of action include priorities for the conservation and sustainable use of the respective components of GRFA. Recent times have, in general, seen progress made in terms of strengthening *ex situ* conservation in all the sectors of food and agriculture. Promoting *in situ* and on-farm conservation and sustainable use has been more challenging.

The management of BFA is constrained by widespread knowledge gaps, exacerbated in places by the loss of traditional knowledge of BFA. Other challenges include the fact that each component of BFA depends on, and interacts with, others across a range of scales, including at landscape or seascape scale. Effective management therefore often requires collaboration among a variety of different stakeholders, both within and beyond the various sectors of food and agriculture.

Inadequate funding, shortages of trained personnel (including in taxonomy and systematics) and shortages of technical resource are widespread constraints, often making it difficult to bridge knowledge gaps, implement management programmes and enforce regulations and policies aimed at protecting biodiversity. Research on management methods and strategies is often hampered by a lack of interdisciplinary collaboration. BFA-related education, training and awareness-raising activities for stakeholders at all levels from producers to policy-makers need to be strengthened. Addressing weaknesses in legal, policy and administrative frameworks is also essential (see [Strategic] Priority Area 3.)

## Priority 2.1 Promote integrated approaches to the management of biodiversity for food and agriculture

### ORIGINAL TEXT WITH PROPOSED AMENDMENTS:

#### [Rationale

A wide range of management practices and approaches can be identified that make use of various components of BFA and therefore contribute to its maintenance and enhanced use, within and outside production systems. Associated biodiversity, in particular, is often managed indirectly rather than through specific actions targeting its sustainable use or conservation.

Management approaches for BFA range in scope from the landscape or seascape to the production system or the individual plot. Landscape and seascape approaches and integrated land- and water-use planning have been adopted, at least to some extent, in numerous countries. Sustainable forest management, the ecosystem approach to fisheries and aquaculture, agroecology and restoration practices[, among others,] are also applied in many countries. At [the] production system level,

<sup>13</sup> See Chapter 5 of FAO. 2019. *The State of the World's Biodiversity for Food and Agriculture*. Rome, for a description of the status and trends in the adoption of over 20 such practices and approaches.]

specific practices related to the diversification of production systems, and specific management practices and production approaches, may promote the sustainable use and conservation of BFA. Such approaches and practices should be more widely applied. However, a lack of research and knowledge, capacity and resources and enabling frameworks [makes] **[may be a barrier to]** their adoption and implementation [difficult].

Many of the management practices and approaches that make use of various components of BFA are relatively complex and require a good understanding of the species composition of the ecosystem, the functions of these species within the ecosystem[, ] [and] the trophic relationships among them **[and interaction with downstream and other interdependent ecosystems]**. Such practices and approaches can be knowledge-intensive, context-specific and provide benefits in the long term rather than the short term. Technical and policy support, as well as capacity development, are needed to overcome these challenges and promote wider implementation.

#### ALTERNATIVE TEXT:

##### **[Rationale**

**Management practices and approaches for BFA range in scale from that of the landscape or seascape to that of the production system or the individual plot. Landscape and seascape approaches and integrated land- and water-use planning have been adopted, at least to some extent, in many countries. Sustainable forest management, the ecosystem approach to fisheries and aquaculture, agroecology and restoration practices, among others, are also applied in many countries. At production-system level, practices related to the diversification of production systems, and specific management practices and production approaches, may contribute to the sustainable use and conservation of BFA. Such approaches and practices should be more widely applied. However, a lack of research, knowledge, capacity, resources and/or appropriate legal, policy and administrative frameworks often constrains their adoption and implementation.**

**Many of the management practices and approaches that make use of diverse components of BFA are relatively complex and require a good understanding of the species composition of the local ecosystem, the functions of these species within the ecosystem, the trophic relationships among them and their interactions with downstream and other interdependent ecosystems. Such practices and approaches can be knowledge-intensive and context-specific and may provide benefits in the long term rather than the short term. Overcoming these challenges and promoting wider implementation require capacity development and technical and policy support.]**

**[Possible] Actions***[Genetic resources for food and agriculture]*

2.1.1 Promote the implementation[, **at all levels,**] of the sectoral global plans of action to improve [the [sustainable use]\* **[management]\*** [of the respective genetic resources], **[as appropriate.]**

**[2.1.1 bis In implementing activities related to the management of BFA, including in the implementation of the sectoral global plans of action, ensure, to the extent possible, that interactions between the sectors of food and agriculture are taken into account and that synergies are promoted and duplication of efforts minimized.]**

ORIGINAL TEXT WITH PROPOSED AMENDMENTS:

**[2.1.1 ter Promote practices and approaches that make use of, conserve and restore associated biodiversity, such as sustainable beekeeping, pollination management and conservation agriculture.]**

*[Integrated management]*

2.1.2 Promote sustainable food and agricultural production practices and approaches[, **including integrated approaches at production system and ecosystem levels,**] that make [sustainable] use of, conserve and restore BFA [**and associated ecosystem services**] while improving livelihoods and supporting economic performance [ and environmental health] [**and healthy ecosystems**] [**for example organic farming, sustainable forest management and ecosystem approaches to fisheries and aquaculture.**]

**2.1.2 bis Promote local markets that help support biodiversity-friendly production systems.]**

**[2.1.2 ter Promote integrated pest management practices and approaches, such as agroforestry, reduced use of pesticides and reduced use of antibiotics, as well as integrated nutrient management and practices, such as integrated animal and crop production systems, that promote soil organic matter accumulation and nutrient cycling.]**

**[2.2.2 quater Promote sustainable land-management practices that yield net climate benefits while enhancing ecosystem services associated with BFA, such as conservation measures, agroforestry and some integrated animal and crop production systems that promote soil organic matter accumulation and nutrient cycling, restoration of degraded forests, rangelands and wetlands, and measures that enhance soil carbon storage in managed landscapes such as reduced or no-till farming practices, cover crops, green manures or intercropping.]**

2.1.3 **[Identify and take]** [Take] into account drivers of change that negatively affect BFA and associated ecosystem services when developing or implementing integrated approaches to the management of BFA.

2.1.4 Promote research, including participatory research, on management practices and approaches that [make use of various] [**contribute or potentially contribute to the sustainable use, conservation and restoration of**] components of BFA.]

2.1.5 [Identify] [**Develop methodologies based on**] best management practices [(including those based on traditional knowledge)] that contribute to the [increased]\* sustainable use and conservation of BFA and develop [guidelines and] tools [**and guidance**] to facilitate their implementation, as appropriate.

**[2.1.6 Promote the use of participatory techniques (including those such as community-made videos, photo stories and infographics) to improve communication on BFA-friendly management practices and approaches.]**

**[2.1.7 Promote interdisciplinary, transdisciplinary, cross-cultural and participatory research-action approaches to improve actions and increase understanding of food systems and biodiversity connections.]**

**[2.1.8 Conduct and promote participatory research on BFA on a regular basis.]**

**[2.1.9 Promote the implementation of access and benefit-sharing for GRFA as a means of improving the sustainable use of these resources, while recognizing their special nature and distinctive features.]**

ALTERNATIVE TEXT:

**[2.1.2 When developing or implementing approaches to the management of BFA, identify and take into account drivers of change affecting BFA and associated ecosystem services.**

**2.1.3 Promote sustainable food and agricultural production practices and approaches, including integrated approaches at production system and ecosystem levels, that make sustainable use of, conserve and restore BFA while improving livelihoods and supporting economic performance, healthy ecosystems and the supply of ecosystem services. Attention should be paid to promoting net climate benefits, soil organic matter accumulation and nutrient cycling. Relevant production practices and approaches potentially include, as appropriate, improved management of pollinators, conservation agriculture, integrated nutrient management practices, intercropping, use of cover crops, use of green manures, reduced use of pesticides, reduced use of antibiotics, agroforestry, integrated animal and crop production, sustainable forest management, sustainable beekeeping, ecosystem approaches to fisheries and aquaculture, organic production and restoration of degraded forests, rangelands and wetlands.**

**2.1.4 Identify, and develop methodologies based on, best management practices (including those based on traditional knowledge) that contribute to the sustainable use and conservation of BFA, and develop tools and guidance to facilitate their implementation, as appropriate.**

**2.1.5 Promote research, including interdisciplinary, transdisciplinary, cross-cultural and participatory research, on BFA and its roles in food systems and on management practices and approaches that contribute or potentially contribute to the sustainable use, conservation and restoration of BFA.**

**2.1.6 Promote awareness raising and sharing of information on BFA-friendly management practices and approaches, including through the use of participatory techniques (for instance community-made videos, photo stories and infographics).**

**2.1.7 Promote the implementation of access and benefit-sharing for GRFA as a means of improving the sustainable use of these resources, while recognizing their special nature and distinctive features.]**

**Priority 2.2 Improve conservation of biodiversity for food and agriculture [and the knowledge that enables such conservation]**

ORIGINAL TEXT WITH PROPOSED AMENDMENT:

**[Rationale**

Conservation systems for GRFA exist, albeit with regional differences in their coverage and effectiveness, and priorities for their conservation have been agreed by the Commission in the sectoral global plans of action. There are many challenges to the conservation of associated biodiversity, including a lack of adequate information on methods and strategies for both *in situ* and *ex situ* conservation. Especially with respect to *ex situ* conservation, there are still biological and technical barriers to the long-term conservation of some species, for example those that cannot be cultured. Another practical constraint is the difficulty of targeting individual associated biodiversity species for conservation programmes. In many cases, it may prove more efficient to prioritize conservation methods and approaches targeting ecosystems than those targeting individual species.

Priorities for action in other **[strategic]** priority areas include addressing the underlying knowledge, resource and policy-related constraints to the establishment of effective conservation programmes for associated biodiversity. With respect to conservation activities and strategies *per se*, priority should be given to expanding the use of *in situ* conservation via biodiversity-friendly management practices in agriculture, forestry, fisheries and aquaculture, including, where relevant, traditional management practices associated with local or indigenous communities. It is important in this context to improve landscape structure to provide habitats for associated biodiversity species. Intercommunity and intracommunity, as well as intergenerational transfer of knowledge and skills that enable continued conservation, development and sustainable use of BFA and its related ecosystem functions, should be promoted.]

#### ALTERNATIVE TEXT:

##### **[Rationale**

**The sectoral global plans of action set out priorities for action to promote the conservation of components of GRFA. Conservation programmes have been put in place, but their coverage and effectiveness need to be improved, particularly in some regions of the world. The conservation of associated biodiversity is constrained by a number of factors, including a lack of adequate information on relevant conservation methods and strategies. Especially with respect to *ex situ* conservation, there are still biological and technical barriers to the long-term conservation of some species. Another constraint is the difficulty of targeting individual associated biodiversity species for conservation programmes. In many cases, it may prove more efficient to prioritize conservation methods and approaches targeting ecosystems than those targeting individual species.**

**Conservation programmes are widely constrained by underlying knowledge gaps, resource limitations and policy weaknesses. Action is needed to address these constraints (see [Strategic] Priority Areas 1 and 3). With respect to conservation activities and strategies *per se*, priority should be given to expanding the use of *in situ* conservation via biodiversity-friendly management practices in crop and livestock production, forestry, fisheries and aquaculture, including, where relevant, traditional management practices associated with local or indigenous communities. It is important in this context to improve landscape structure so as to provide habitat for associated biodiversity species. This may involve, for example, maintaining areas of natural or semi-natural habitat within and around production systems, including systems that are intensively managed, and where necessary restoring or reconnecting damaged or fragmented habitats. Threats to BFA, including biodiversity-damaging practices in crop and livestock production, forestry, fisheries and aquaculture and in the use of wild foods, need to be addressed via action at all relevant levels. Intercommunity and intracommunity, as well as intergenerational, transfer of knowledge and skills that contribute to conservation and sustainable use of BFA should be promoted.]**

##### **[Possible] Actions**

*[Genetic resources for food and agriculture]*

2.2.1 Promote the implementation[, **at all levels,**] of the sectoral global plans of action to improve [the] *in situ*, on-farm and *ex situ* conservation [of the respective genetic resources][, **as appropriate**].

**[2.2.1 bis In implementing activities related to the conservation of BFA, including in the implementation of the sectoral global plans of action, ensure, to the extent possible, that interactions between the sectors of food and agriculture are taken into account and that synergies are promoted and duplication of efforts minimized.]**

*[Associated biodiversity], wild foods] and ecosystem services]*

2.2.2 Identify priority species, ecosystems and ecosystem services for conservation **[and restoration]** at national level and establish targets or goals relative to these priorities.

2.2.3 Strengthen conservation programmes, in particular *in situ* or on-farm conservation, which may be more effective for many types of associated biodiversity and wild foods, and seek to optimize complementarity between *in situ* and *ex situ* conservation approaches, where appropriate.

ORIGINAL TEXT WITH PROPOSED AMENDMENTS:

[2.2.4 Promote conservation **[and restoration]** **[of BFA]** **[of associated biodiversity]** **[via biodiversity-friendly management practices in crop and livestock production, forestry, fisheries and aquaculture, including, where relevant,]** [through a combination of] **[through]** **[by evaluating the relevance of]** [traditional management practices and innovative technologies] **[innovative technologies and traditional management practices]**, as appropriate[, and improve their use for characterization, collection, storage, documentation or data management].

**[2.2.4 bis Improve landscape structure to provide habitats for associated biodiversity and wild food species.]**

**[2.2.4 ter In planning and implementing nature protection activities, take into account, as relevant, the roles of BFA, at genetic, species and ecosystem levels, in supplying ecosystem services to food and agricultural systems and more generally.]**

[2.2.5 Establish or strengthen effective infrastructure, including at **[the]** local level, for the conservation **[and restoration]** of **[BFA, including]** micro-organism[s], invertebrate[s] and other associated biodiversity [species] [, **and wild foods]**, and improve documentation and overviews of collections within countries.]

2.2.6 Create and strengthen networks, including at national and regional levels, **[for]** linking users and communities that maintain **[and/or restore]** associated biodiversity and ecosystem services on-farm and *in situ*, research institutes, scientists and other relevant stakeholders[, ***inter alia* to facilitate the sharing of data and best practices]**].

**[2.2.6 bis Develop, promote and support community and cross-cultural partnerships involving scientists and indigenous and local communities that are holders of traditional knowledge to facilitate the sustainable use and *in situ* and on-farm conservation of BFA.]**

2.2.7 Promote[, **where appropriate,**] multipurpose production systems managed for sustainable use, conservation **[and restoration]** of BFA **[and for the supply of a range of ecosystem services]**[, such as multiple-use forests].

2.2.8 **[Maintain, develop or expand ]**[Develop or expand] designated areas, such as protected areas (including International Union for Conservation of Nature Categories 5 and 6) and other effective area-based conservation measures for BFA and related ecosystem services, as well as Globally Important Agricultural Heritage Systems[ and areas recognized for origin-linked products (e.g. geographic indications)].

**[2.2.9 Establish regulatory frameworks that guarantee and promote the use, selection, exchange and conservation of seeds, propagules and knowledge associated with BFA by producers and communities.]]**

ALTERNATIVE TEXT:

**[2.2.4 Promote the conservation and restoration of BFA through the use of biodiversity-friendly management practices in crop and livestock production, forestry, fisheries and aquaculture, including, where relevant, through a combination of and innovative technologies and traditional management practices.**

**2.2.5 Promote, where appropriate, multipurpose production systems managed for the sustainable use, conservation and restoration of BFA and for the supply of a range of ecosystem services.**

**2.2.6 Improve, where appropriate, landscape structure to provide habitats for associated biodiversity and wild food species.**

**2.2.7 Establish or strengthen effective infrastructure, including at the local level, for the *ex situ* conservation of BFA, including micro-organisms, invertebrates and other components of associated biodiversity, and wild foods, and improve documentation and overviews of collections within countries.**

**2.2.8 In planning and implementing nature protection activities, take into account, as relevant, the roles of components of BFA in supplying ecosystem services to food and agricultural systems and more generally.**

**2.2.9 Create and strengthen networks, including at national and regional levels, linking users and communities that manage associated biodiversity and ecosystem services on-farm and *in situ*, research institutes, scientists and other relevant stakeholders, *inter alia* to facilitate the sharing of data and of best practices.**

**2.2.10 Develop, promote and support community and cross-cultural partnerships involving scientists and indigenous peoples and local communities that are holders of traditional knowledge to facilitate the sustainable use and *in situ* and on-farm conservation of BFA.**

**2.2.11 Maintain, develop or expand designated areas, such as protected areas (including International Union for Conservation of Nature Categories 5 and 6) and other effective area-based conservation measures for BFA and related ecosystem services, as well as Globally Important Agricultural Heritage Systems and areas recognized for origin-linked products.]**

### **[STRATEGIC] PRIORITY AREA 3: INSTITUTIONAL FRAMEWORKS FOR BIODIVERSITY FOR FOOD AND AGRICULTURE**

#### ORIGINAL TEXT WITH PROPOSED AMENDMENTS:

##### **[Introduction**

[In developing countries in particular, increasing demand for food production is driving rapid structural change in agriculture sectors, often related to land-use change and habitat degradation and fragmentation.] Proper policies and management frameworks, including spatial and physical planning, are essential to ensure the conservation of BFA and the provision of ecosystem services, sustainable production and human well-being and health.

In addition to developing national planning capacity, popular awareness of the importance of BFA needs to be increased in order to promote investments in the sustainable management of BFA. In many instances to date, agriculture-sector development has focused on the promotion of [intensification packages that depend] **[agricultural intensification that depends]** on external inputs, rather than on improving management of associated biodiversity to promote the supply of regulating and supporting ecosystem services.

[As noted under Priority Area 1, one]\* **[One]\*** of the major constraints to the development, adoption and implementation of policies for the sustainable use and conservation of BFA is the significant lack of data on the characteristics of ecosystems and limited understanding of ecosystem functions and services, and specifically the roles of BFA in this context **[(see Priority Area 1 for actions addressing such gaps)]\***. **[To ensure evidence-based decision-making, planning and policies, research efforts on biodiversity need to be better supported so as to improve understanding of interactions within and among species diversity, genetic diversity and the environment.]**

As noted under Priority Area 2, other constraints include weaknesses in legal, policy and institutional frameworks. Regulating and supporting ecosystem services, and the conservation of the associated biodiversity that underpins their supply, are insufficiently mainstreamed into sectoral policies, both within food and agriculture and beyond. [General biodiversity-related policy frameworks usually give limited attention to associated biodiversity. Where relevant policies and laws exist, their implementation is often inadequate. Lack of consultation between policy-makers at national or regional levels and stakeholders at local level is leading to a disconnection between political and operational levels.]

[Producers in all agriculture sectors rely on BFA. Despite their significance to BFA management, small-scale and indigenous producers – including women – are often marginalized and excluded from decision-making processes that affect their production systems.] Many producers' and community-based organizations play significant roles both in providing practical support to the sustainable management of BFA and in advocating policies or marketing strategies that support the roles of small-scale producers as custodians of BFA.

[Many small-scale producers depend on communal resources for their livelihoods.] Social and economic policies need to aim at ensuring equity for rural populations, so that they are enabled to build up, in a sustainable way, their productive capacity to supply goods and services in increasing quantity and of increasing quality to expanding national economies. [This includes regulating and supporting ecosystem services for clean water, fresh air and healthy soils, for which no market exists in many countries.]

Economic **[analysis, including economic]** valuation [tools] can help to make the hidden benefits and costs of biodiversity and biodiversity loss more visible, increasing awareness of the need for conservation and driving more effective conservation policies, including incentive schemes. However, quantifying the values of ecosystem services and biodiversity is often challenging because of the difficulty and cost of data collection, the complexity of the ecological processes involved, and

geographical and cultural differences in how biodiversity and the benefits it provides are perceived. A number of country reports highlight the importance of valuation studies, but note that major knowledge gaps remain.

In many countries, the market for certified products with health-promoting attributes or products that comply with environmental or social standards can be expected to increase. Such increased consumer demand provides opportunities for producers to combine income generation with biodiversity-friendly production. An increased share of high-value products, linking back to specific biodiversity-friendly production practices, may contribute to the sustainable use of BFA. Cultural identity, often expressed in terms of food preferences, can provide a basis for a growing awareness of the value of BFA, including for small producers and currently marginal communities.

**[Economic instruments such as i)]** Incentives for the sustainable use and conservation of BFA can take a range of forms and originate from public programmes, private-sector investments or civil-society initiatives. Incentive measures are still often absent and where they do exist a lack of coordination in their implementation often hampers success. Combining a range of incentive measures **[consistent with international obligations and with national law]** into an integrated package may promote the sustainable use and conservation of BFA.

[As noted under Priority Area 2, constraints include a lack of collaboration and coordination between stakeholders. Coordination within and beyond agriculture sectors, including at policy level, is generally weak. Gaps in this regard include a lack of adequate links between ministries, between researchers and policy-makers and between policy-makers and stakeholders at production-system and community levels. The integrated management, sustainable use and conservation of BFA cross the conventional organizational and administrative boundaries between sectors, nationally, regionally and internationally.]

[In a time of rapid change and growing privatization, national planning will need to ensure the long-term supply of public goods, including biodiversity maintenance and ecosystem services, such as clean air and secure water supplies, and human health. Such national planning will inevitably lead to trade-offs between different national policy goals.] Short- and long-term policies for the sector, integrated within the larger cross-sectoral planning framework for the achievement of the SDGs, are required.]

#### ALTERNATIVE TEXT:

##### **[Introduction**

**Proper institutional frameworks – including appropriate policies and legislation, effective mechanisms for their implementation and effective mechanisms for raising awareness, engaging stakeholders and promoting cooperation and exchange of information – are vital to the conservation and sustainable use of BFA and to maintaining its role in the supply of ecosystem services.**

**Institutional frameworks for the management of BFA, and in particular for associated biodiversity and wild foods, are often inadequate. For example, BFA is often insufficiently mainstreamed into sectoral policies, both within the food and agriculture sector and beyond. General biodiversity-related policy frameworks usually give limited attention to the links between biodiversity and food and agriculture. Where relevant policies and laws exist, their implementation is often weak. As noted under [Strategic] Priority Area 2, lack of collaboration and coordination among stakeholders is a widespread constraint to improving the management of BFA. Significant gaps often include a lack of adequate links between ministries, between researchers and policy-makers and between policy-makers and stakeholders at production-system and community levels.**

**Producers, particularly small-scale and indigenous producers – including women – are often marginalized and excluded from decision-making processes that affect their production systems. However, many producers' and community-based organizations play significant roles both in**

**providing practical support to the sustainable management of BFA and in advocating policies or marketing strategies that support the roles of producers as custodians of BFA. Social and economic policies need to aim to ensure equity for rural populations – including by protecting, and ensuring equitable access to, the communal resources relied upon by many small-scale producers – so that they are able to build up their productive capacity in a sustainable way.**

**One of the major constraints to the development, adoption and implementation of effective policies and legislation for the sustainable use and conservation of BFA is a lack of data on the characteristics of ecosystems and limited understanding of ecosystem functions and services, and specifically the roles of BFA in this context (see [Strategic] Priority Area 1 for actions addressing such gaps). Research in these fields therefore needs to be strengthened.**

**Many of the regulating, supporting and cultural ecosystem services provided by BFA are generally not traded on markets and hence their values are often not recorded in economic statistics. This may contribute to their being overlooked in policy-making. Economic analysis, including economic valuation, can help to make the hidden benefits and costs of biodiversity and biodiversity loss more visible and hence increase awareness of the need for conservation and drive more effective conservation policies. National planning needs to ensure the long-term supply of public goods associated with the maintenance of BFA and the supply of ecosystem services.**

**Incentives and other economic instruments for promoting the sustainable use and conservation of BFA can take a range of forms and originate from public programmes, private-sector investments or civil-society initiatives. Incentive measures are still often absent and where they do exist a lack of coordination in their implementation often constrains their success. In many countries, the market for certified products with health-promoting attributes or products that comply with environmental or social standards can be expected to increase. This may provide opportunities to promote biodiversity-friendly production.**

**Overall, the management of BFA needs to be properly integrated into short- and long-term policies for the development of the food and agriculture sector and into broader cross-sectoral planning frameworks for the achievement of the SDGs.]**

**Priority 3.1 [Build capacity through awareness raising, research, education and training] [Build capacity through awareness raising, research, education, training, university outreach and science–traditional knowledge cross-cultural knowledge co-production]**

#### ORIGINAL TEXT WITH PROPOSED AMENDMENTS:

##### **[Rationale**

Research, education and training, at all levels, are widely recognized as key means of promoting the sustainable management of BFA. As described in [Strategic] Priority Areas 1 and 2, despite their vital contributions to food and agriculture, knowledge of [the many]\* components of BFA, ecosystem services and the impacts of drivers and management practices and approaches needs to be improved to better guide decision-making.

In many developing countries in particular, a lack of human capacity and financial resources is a major obstacle to developing the necessary institutions and to planning and implementing a strategic approach to managing, sustainably using and conserving BFA. [For this reason, and in order to achieve these objectives,]\* many countries will need to devote particular attention to establishing and building up relevant institutions, adopting and implementing appropriate policies and effective

regulatory frameworks and building a strong and diverse skills base, including in taxonomy and through citizen science.<sup>14</sup>

Education and training in order to build sustainable capacity in all priority areas are required. Research at national and international levels in all aspects of BFA management needs to be strengthened. The support of agricultural research, for example National Agricultural Research Systems (NARS) and research networks on associated biodiversity, is crucial in this context.]

#### ALTERNATIVE TEXT:

##### **[Rationale**

**Awareness raising, research, education and training, at all levels, are widely recognized as key means of promoting the sustainable management of BFA. As noted under [Strategic] Priority Areas 1 and 2, despite their vital contributions to food and agriculture, knowledge of components of BFA and the ecosystem services they provide, as well as of how they are affected by management practices and approaches and other drivers of change, needs to be improved.**

**In many developing countries in particular, a lack of human capacity is – along with a lack of financial resources – a major obstacle to efforts to improve the management of BFA. Many countries will need to devote particular attention to establishing and building up research, educational and training institutions and establishing a strong and diverse skills base, including in taxonomy and through citizen science.<sup>15</sup>**

**Research at national and international levels into all aspects of BFA management needs to be strengthened, including through support for National Agricultural Research Systems (NARS) and the establishment or strengthening of research networks on associated biodiversity.]**

##### **[Possible] Actions**

*[Genetic resources for food and agriculture]*

3.1.1 Promote the implementation[, **at all levels,**] of the sectoral global plans of action to [raise awareness of the roles and values of [GRFA]\***[the respective genetic resources]\*** and build capacity to strengthen research, education and training for their sustainable use and conservation,] **[raise awareness and strengthen research, education and training,**] as appropriate.

**[3.1.1 bis In implementing activities related to awareness raising, research, education and training on BFA and its management, including in the implementation of the sectoral global plans of action, ensure, to the extent possible, that interactions between the sectors of food and agriculture are taken into account and that synergies are promoted and duplication of efforts minimized.]**

#### ORIGINAL TEXT SHOWING PROPOSED AMENDMENTS:

*[[Associated biodiversity],**wild foods**] and ecosystem services]*

3.1.2 Raise awareness [at the national level] **[at all levels]** of the importance of **[BFA, including in particular]** associated biodiversity **[and wild foods,]** and ecosystem services **[it provides]**, and of the need for [their] **[its]** sustainable use and conservation, among farmers, livestock keepers, fisherfolk, forest dwellers, the wider public, donors, policy-makers, the private sector, consumers, children and youth and the media[, **and develop relevant capacity].**

3.1.3 Support regional and international campaigns to raise awareness of the importance of **[BFA, including in particular]** associated biodiversity **[and wild foods,]** and the ecosystem services it

<sup>14</sup> [Citizen science refers here to the collection of data relating to biodiversity by the general public.]

<sup>15</sup> [Citizen science refers here to the collection of data relating to biodiversity by the general public.]

provides, and of the need for its sustainable use[,] [and] conservation **[and restoration]**, with a view to strengthening support from governments, institutions and other relevant stakeholders.

3.1.4 Improve capacity for research on **[wild foods,]** associated biodiversity and ecosystem services and encourage the formation of multi[-, **inter- and trans]**disciplinary research teams[, **fostering diversity of participation as a step towards better-qualified scientific production.**] Promote innovative ways of building capacities, such as through the use of information and communication technologies **[and including action-oriented research and cross-cultural co-production of knowledge between scientists and indigenous and local communities of traditional-knowledge holders].**

3.1.5 Strengthen cooperation[,] [and] synergies **[and exchange of information – including between scientists and producers and other stakeholders directly involved in BFA management, at local and regional levels –]** in research on **[wild foods,]** associated biodiversity and ecosystem services and other components of BFA and improve the transfer of research outputs to producers and policy-makers.]

#### ALTERNATIVE TEXT:

**[3.1.2 Raise awareness, at all levels, of the importance of BFA, including in particular associated biodiversity and wild foods, of the ecosystem services it provides and of the need for its sustainable use, conservation and restoration, including by supporting regional and international awareness-raising campaigns, with a view to strengthening support from governments, institutions and other relevant stakeholders. Develop relevant capacity to support these efforts, as required.**

**3.1.3 Improve capacity for research on BFA, in particular on associated biodiversity, wild foods and ecosystem services, including through the formation of multi-, inter- and transdisciplinary research teams and by strengthening mechanisms for cooperation and exchange of information between scientists and producers and other stakeholders involved in the management of BFA. Promote innovative ways of building capacity, for example through the use of information and communication technologies and through participatory approaches involving, *inter alia*, indigenous and local communities of traditional-knowledge holders.**

**3.1.4 Improve the transfer of the outputs of research on BFA, in particular on associated biodiversity, wild foods and ecosystem services, to producers and policy-makers.]**

#### *[Integrated approaches]*

3.1.6 Strengthen the teaching of **[genetic-resources management,]** taxonomy, soil science, ecology, **[agroecology,]** systems biology[, **ethnology, sociology, health studies]** and other cross-sectoral subjects relevant to BFA in universities, schools and in professional and informal education targeting various stakeholders, including citizen scientists.

**[3.1.6 bis Promote the implementation of access and benefit-sharing for GRFA as a means of raising awareness of the roles and values of these resources and their special nature and distinctive features and of building capacity to strengthen research, education and training on their sustainable use and conservation, as appropriate.]**

3.1.7 Integrate BFA issues into education and training so as to promote interdisciplinary skills among practitioners **[and other stakeholders].**

3.1.8 Promote opportunities for ongoing training and education for farmers, fisherfolk, livestock keepers and forest dwellers, including via farmer field schools, producer group extension programmes or community-based organizations, to strengthen the sustainable use and conservation of BFA and the ecosystem services it supports.

3.1.9 Strengthen research-related policy frameworks **[for BFA]** to ensure support for long-term research activities, and increase the availability of human, physical and financial resources for this purpose.

3.1.10 **[Incentivize,] [Promote,]** through various means (e.g. increasing recognition, including through adequate remuneration, providing adequate infrastructure, such as laboratories, and logistical support), education and research in the field of BFA.

### Priority 3.2 Strengthen legal, policy and incentive frameworks

#### Rationale

Appropriate legal and policy frameworks are essential for the effective management of BFA, but often remain underdeveloped or poorly implemented. Improving such frameworks is challenging, particularly in view of the multiple stakeholders and interests involved and the need for provisions to keep up with emerging issues in BFA management. Laws and policies beyond the field of BFA management with indirect or unintended effects on BFA are also often overlooked. With regard to associated biodiversity and ecosystem services in particular, a lack of adequate coordination between the food and agriculture and nature conservation sectors and limited understanding of these **[components]\* [aspects]\*** of biodiversity and of their significance to food and agriculture among policy-makers are major constraints to the development of adequate laws and policies.

The importance of valuation of biodiversity and ecosystem services is widely recognized. Nevertheless, the integration of the results of **[economic analyses, including]** valuation studies<sup>[,]</sup> into national accounting systems or into broader measures of social welfare is limited<sup>[,]</sup> **and major knowledge gaps remain, including with respect to microbial genetic resources, wild pollinators and wild medicinal plants]\***. **[Valuation data] [Economic analyses and ecosystem service valuation data]** could play a more prominent role **[in BFA management]\*, inter alia** in the development of conservation strategies and research programmes. **[Overall, valuation efforts for BFA and ecosystem services still need to fill major knowledge gaps, including, for example, with respect to microbial genetic resources, wild pollinators and wild medicinal plants.]\***

**[In terms of the use of incentive programmes, countries often use individual incentive schemes rather than approaches based on multiple incentive measures.] [Countries often use incentives and other economic instruments to promote various aspects of sustainable management of BFA. However, these instruments are often used in isolation and not coordinated with each other.]** While individual public programmes, private-sector investments or civil-society initiatives may provide incentives related to their own particular purposes, a coordinated package of **[economic]** measures can create a much larger impact in terms of improving outcomes for BFA. Challenges to the establishment of multiple-incentive programmes include the need for a suitable enabling environment to support the high level of coordination required between institutions and across scales (international, national and subnational), the need to engage with the private sector and promote responsible investment, and the need for cross-sectoral dialogue, i.e. among the environmental, food and agriculture **[production]\*** and other sectors **[in the food system]\***. Overall, there is also a need to better document and map **[incentive schemes] [economic instruments that are used, or could be used, to promote the sustainable management of BFA.]**

#### **[Possible] Actions**

*[Genetic resources for food and agriculture]*

3.2.1 Promote the implementation<sup>[, at all levels,]</sup> of the sectoral global plans of action to strengthen institutions and policy frameworks for **[GRFA]\*[the respective genetic resources]\***, as appropriate.

**[3.2.1 bis In implementing activities related to strengthening institutions and policy frameworks for the management of BFA, including in the implementation of the sectoral global plans of action, ensure, to the extent possible, that interactions between the sectors of food and agriculture are taken into account and that synergies are promoted and duplication of efforts minimized.]**

ORIGINAL TEXT WITH PROPOSED AMENDMENTS:

*[Integrated approaches]*

[3.2.2 Develop coherent cross-sectoral policies and programmes for the [management,]\* sustainable use[.], [and] conservation [**and restoration**] of BFA at national and regional levels, addressing the various sectors of GRFA, ecosystem services, associated biodiversity and wild foods and establishing systems or mechanisms that provides integrated and multisectoral support.

**[3.2.2 bis In developing or strengthening legislative, administrative and policy frameworks for the management of BFA, ensure that they are aligned, to the extent feasible, with the SDG Framework and promote the contributions of BFA and its management to efforts to meet the SDGs.]**

[3.2.3 Adapt existing or develop new legislation or policies to counter drivers of change that negatively affect BFA and associated ecosystem services.]

3.2.4 Mainstream BFA into [existing]\* national policies, programmes and strategies on biodiversity [(e.g. NBSAPs) [and into those with a possible], **those on agriculture, forestry, fisheries and aquaculture, and others that may have an**] impact on BFA, for example through the establishment of cross-sectoral (interministerial) and multistakeholder working groups (taking into account existing efforts, as relevant).]

3.2.5 Encourage [**the governing bodies of**]\* relevant international organizations to consider [**– as appropriate and consistent with their respective mandates –**]the importance of BFA and the ecosystem services it supports when revising global agreements on biodiversity [**and on agriculture, forestry, fisheries and aquaculture.**]

3.2.6 Inventory and review existing legislative, administrative and policy measures on the [use and conservation of]\* [**use, conservavtion and restoration of**] – and access to and [exchange of] [**sharing of benefits arising from the use**] – BFA, their implementation and the extent of their (negative or positive) impacts on the sustainable use of BFA. Where gaps are identified, [strengthen or develop] [**strengthen, develop or harmonize**] such measures, as appropriate.

3.2.7 Develop and standardize valuation methodologies and tools for BFA and ecosystem services.

**[3.2.7 bis Promote studies and economic analyses, including ecosystem service valuation studies, that identify the value of BFA and ecosystem services in the production of food and fibre].**

3.2.8 Conduct assessments, including participatory assessments, of the use and non-use values of BFA, in particular ecosystem services, associated biodiversity and wild foods, building as far as possible on existing information and assessments.

3.2.9 Document and map existing incentive schemes [for the] [**and other economic instruments employed to**] improve[d] [**the**] management of BFA across the environmental and food and agriculture sectors and [the] public, non-governmental and private[-sector stakeholders]\* [**sectors**].\*

3.2.10 [Strengthen and establish]\* [**Establish or strengthen**]\* national policies, strategies and frameworks that [provide support, including through incentives [**or other economic instruments**], to producers and other value-chain actors in applying practices that] [**incentivize value chains in which producers and other actors apply practices that**] favour the [maintenance and] sustainable use[, **conservation and restoration**] of BFA and ecosystem services, [in particular indigenous and local production system stakeholders. Relevant incentives and support in this context may include the provision of extension services, delivery of microcredit for women in rural areas, appropriate access to natural resources and to the market, resolving land-tenure issues, recognition of cultural practices and values, and adding value to their specialist products].**[The said incentives [or other economic instruments] should be consistent with relevant international agreements.]**

3.2.11 Strengthen policy and institutional frameworks for integrating the outcomes of **[economic analyses, including]** valuation studies[,] into incentive schemes and conservation strategies. **[The said incentives should be consistent with relevant international agreements.]**

3.2.12 **[If feasible, i]** **[I]**mprove coordination in the management of **[economic instruments including]** incentive schemes between the environment and food and agriculture sectors and between public-sector, non-governmental and private-sector stakeholders[, **and eliminate incentives harmful to biodiversity]**. **[The said incentives [or other economic instruments] should be consistent with relevant international agreements.]**

3.2.13 Enhance cooperation between the different actors in the value chain, and, where possible, promote short value chains and diverse retail infrastructures to strengthen the linkages between farmers, markets and consumers.]

**[3.2.13 bis Adapt policies and investment decisions in the various sectors of food and agriculture so that they better account for the negative impacts of ecosystem degradation and the co-benefits of investments in nature.]**

3.2.14 Raise consumer awareness, including by supporting marketing that encourages consumers to make responsible and sustainable purchasing choices.

3.2.15 Further develop [markets and] **[local and regional markets to support]** value chains for products from production systems that favour the [maintenance] **[conservation]** and sustainable use of BFA [(e.g. through labelling, certification, traceability, denomination of origin, [geographic identification,] branding, gastronomy and tourism)] and[, **where appropriate,**] promote the use of local/traditional foods to improve nutrition and health.]

**[3.2.15 bis Apply the principles of the circular economy and develop resource-efficiency targets in the food system to support the sustainable use, conservation and restoration of BFA and to promote changes in consumption and production patterns.]**

**[3.2.15 ter Promote responsible and sustainable sourcing of raw materials and commodities in the food system, including by reconciling sourcing with the protection of ecosystems and biodiversity in source countries.]**

#### ALTERNATIVE TEXT:

**[3.2.2 Inventory and review existing legislative, administrative and policy frameworks on the use, conservation and restoration of – and access to and sharing of benefits arising from the use of – BFA, their implementation and the extent of their (negative or positive) impacts on the sustainable use of BFA. Where gaps, weaknesses or inefficiencies are identified, address them by developing new measures or strengthening or harmonizing existing measures, as appropriate.**

**3.2.3 In reviewing and, as relevant, updating legislative, administrative and policy frameworks for the management of BFA, ensure that all components of BFA are adequately mainstreamed into relevant frameworks (e.g. those for biodiversity in general, those for the various sectors of food and agriculture, those for other sectors that may have an impact on BFA and those for research and education) and that cross-sectoral considerations (e.g. interactions, synergies and trade-offs in the management of BFA across the crop, livestock, forest, fisheries and aquaculture sectors) are adequately addressed, for example through the establishment of cross-sectoral (interministerial) and multistakeholder working groups, as appropriate and taking into account existing efforts.**

**3.2.4 In reviewing and, as relevant, updating legislative, administrative and policy frameworks for the management of BFA, ensure that they include adequate measures to counter drivers of change that negatively affect BFA and associated ecosystem services.**

**3.2.5 In reviewing and, as relevant, updating legislative, administrative and policy frameworks for the management of BFA, ensure that they are aligned, to the extent feasible, with the SDG Framework and promote the contributions of BFA and its management to efforts to meet the SDGs.**

- 3.2.6 Encourage the governing bodies of relevant international organizations to consider – as appropriate and consistent with their respective mandates – the importance of BFA and the ecosystem services it supplies when revising global agreements on biodiversity and on crop and livestock production, forestry, fisheries and aquaculture.**
- 3.2.7 Promote the implementation of studies, including participatory assessments, that identify the use and non-use values of BFA and the ecosystem services it provides – and of other relevant economic analyses – including by developing and standardizing economic methodologies and tools. Such studies should, as far as possible, build on existing information and assessments.**
- 3.2.8 Promote the integration of the outcomes of economic analyses, including valuation studies, into conservation strategies and other aspects of BFA management.**
- 3.2.9 Document and map existing incentive schemes and other economic instruments employed to improve the management of BFA across the environmental and food and agriculture sectors and the public, non-governmental and private sectors. Where gaps, weaknesses or inefficiencies are identified, address them by developing new instruments or strengthening or harmonizing existing instruments, as appropriate and consistent with relevant international agreements.**
- 3.2.10 Promote and incentivize – consistent with relevant international agreements – production systems that sustainably use and conserve BFA. Potential measures in this context may include, as relevant: improving the availability of extension services; improving the availability of microcredit, including for women, in rural areas; enabling appropriate access to natural resources and to the market; resolving land-tenure issues; and ensuring the recognition of relevant cultural practices and values.**
- 3.2.11 Promote and incentivize – consistent with relevant international agreements – local and regional markets and value chains – including where possible short value chains and diverse retail infrastructures that strengthen the linkages between producers and consumers – for products from production systems that favour the conservation and sustainable use of BFA. Potential measures in this context may include, as relevant: adding value to relevant products, for example by establishing or strengthening labelling, certification and traceability schemes or promoting touristic and gastronomic activities involving local and/or traditional foods; raising awareness among consumers with regard to responsible and sustainable purchasing choices; where appropriate, promoting the consumption of local foods to improve nutrition and health; and improving cooperation among actors in the value chain.**
- 3.2.12 Eliminate incentives harmful to biodiversity.**
- 3.2.13 Adapt policies and investment decisions in the various sectors of food and agriculture so that they better account for the negative impacts of ecosystem degradation and the co-benefits of investments in nature.**
- 3.2.14 Apply the principles of the circular economy and develop resource-efficiency targets in the food system to support the sustainable use, conservation and restoration of BFA and to promote changes in consumption and production patterns.**
- 3.2.15 Promote responsible and sustainable sourcing of raw materials and commodities in the food system, including by reconciling sourcing with the protection of ecosystems and biodiversity in source countries.**
- 3.2.16 Promote, as appropriate, the implementation of access and benefit sharing measures for GRFA as a means of improving the sustainable use of these resources, raising awareness of their roles and values and building capacity to strengthen research, education and training for their sustainable use and conservation, while recognizing the special nature and distinctive features of GRFA.]**

**Priority 3.3 [Cooperation and funding]\* [Improve cooperation and funding]\***

## Rationale

The management of BFA spans the conventional boundaries between the sectors of food and agriculture and those between food and agriculture and nature conservation. Strengthening the sustainable use and conservation of BFA often requires actions on a large geographical scale (e.g. across watersheds or along migration routes) and involving a wide range of different stakeholders. The distributional ranges of associated biodiversity species often cross national boundaries. [Global challenges such as climate change and emerging disease threats require global responses.] Multistakeholder, cross-sectoral and international cooperation in BFA assessment, monitoring and management is therefore vital.

Cooperation within and between countries is needed in order to develop national and regional networks. Networks are important in linking stakeholders, and in supporting research, institutional development and capacity building. [In some countries where networks are well developed, they draw upon the support of active non-governmental organizations, including from the environment sector, and consumers.] [National Focal Points for BFA – established for the development of country reports on the state of BFA – could become key agents of change through which networks for the management of BFA could be built and maintained].\* **[National Focal Points for BFA – established for the development of country reports on the state of BFA – could become key agents in the building of networks for the management of BFA.]\***

Numerous **[subregional,]\*** regional and international collaborative initiatives target the sustainable use and conservation of crop, livestock, forest and aquatic genetic resources. [While a number of subregional, regional and international organizations and partnerships contribute to the management of specific components of associated biodiversity, including through projects targeting pollinators or biological control agents or *ex situ* collections, far fewer such efforts target the management of associated biodiversity or its role in providing ecosystem services to food and agriculture.]\* **[There are generally far fewer such efforts targeting associated biodiversity and its roles in providing ecosystem services to food and agriculture, although a number of initiatives at these levels contribute to the management of specific components of associated biodiversity, including through projects targeting pollinators, biological control agents or *ex situ* collections.]\***

[Besides lack of political will and/or governance, capacity, awareness, knowledge and cooperation, lack of financial resources is one of the major constraints to the effective implementation of all actions listed in all three [strategic] priority areas for the sustainable use and conservation of all BFA.]\*

**[Along with deficiencies in terms of political will and/or governance, capacity, awareness, knowledge and cooperation, shortages of financial resources are among the major constraints to the effective implementation of all the actions listed in all the three [strategic] priority areas of this document.]\***

## [Possible] Actions

### [Cooperation]

3.3.1 Inventory and describe [relevant]\* **[national and regional]** institutions [and their mandates to enable the development of]\* **[with mandates related to the management of BFA to enable the establishment or strengthening of relevant]\*** coordination mechanisms [for the establishment of, for example, a national BFA steering committee to strengthen collaboration between relevant institutions, seek synergies and coordinate the implementation of their respective activities].

3.3.2 Improve [multi-stakeholder]\* cooperation between producers, researchers, consumers and policy-makers[,]\* within the sectors of agriculture [and between agriculture and other sectors]\* **[and more widely]\***, in order to [reduce the gap between policies and reality on the ground]\* **[facilitate the development of more relevant and effective BFA-related policies]\***.

3.3.3 [Establish new and promote existing] **[Promote existing and/or establish new]** national, regional or global networks linking scientists [and researchers]\* **[, researchers and other stakeholders]\*** to improve [information sharing] **[the sharing of information related to BFA and its management]**.

3.3.4 Further develop and strengthen international cooperation to mainstream BFA within and beyond agriculture sectors. **[Disseminate examples of successful cooperation].**

3.3.5 [Ensure **[that, as appropriate, cooperative activities in all fields of BFA management give]\*** special attention [is given]\* to sustainable smallholder agriculture and to the role of women as [knowledge]\* keepers [of knowledge on]\* BFA], across [strategic] priority areas and actions, as appropriate]\*. **[Also ensure that such activities contribute to maintaining and enhancing economic and environmental sustainability in all types of production system, including production systems in industrialized countries.]]**

**[3.3.5 bis Further develop and strengthen international cooperation, including triangular and South–South cooperation, to foster capacity building, technical assistance and technology transfer related to the management of BFA, especially in and to developing countries.]**

**[3.3.5 ter Promote the sharing of benefits arising from the use of GRFA through international instruments, such as the Multilateral System of the International Treaty on Plant Genetic Resources for Food and Agriculture and the Nagoya Protocol to the CBD, considering the importance of such financial resources to the conservation and sustainable use of GRFA, especially in developing countries, and the special nature of GRFA and its distinctive features.]**

*[Funding]*

3.3.6 Explore opportunities, and where possible establish fund-raising mechanisms and integrated investment plans, for research, training and capacity development on – and assessment and monitoring, sustainable use and *in situ* and *ex situ* conservation of – BFA and ecosystem services.

3.3.7 Identify opportunities for efficient use of resources, for example by promoting synergies and cooperation between projects at national and regional levels.

3.3.8 Support the funding strategies for the Commission’s sectoral global plans of action and the implementation of its Multi-year Programme of Work.

## ANNEX 1

## ORIGINAL TEXT SHOWING PROPOSED AMENDMENTS:

[Table 1. Concepts used in the document

Biodiversity		Biological diversity (often referred to as biodiversity) is defined in Article 2 of the Convention on Biological Diversity (CBD) as “the variability among living organisms from all sources including, <i>inter alia</i> , terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part: this includes diversity within species, between species and of ecosystems”. <sup>16</sup>
Biodiversity for food and agriculture (BFA)		BFA is a subcategory of biodiversity taken for the purposes of <i>The State of the World’s Biodiversity for Food and Agriculture</i> [report]* to correspond to “the variety and variability of animals, plants and micro-organisms at the genetic, species and ecosystem levels that sustain the ecosystem structures, functions and processes in and around production systems, and that provide food and non-food agricultural products”. <sup>[17]</sup> Production systems are here taken to include those in the crop, livestock, forest, fishery and aquaculture sectors.
[Components of BFA]		[BFA includes plant, animal and aquatic genetic resources for food and agriculture, forest genetic resources, micro-organism and invertebrate genetic resources, associated biodiversity and wild foods.]
	[Genetic resources for food and agriculture]	Plant genetic resources for food and agriculture (PGRFA)
		Animal genetic resources for food and agriculture (AnGR)
		The term PGRFA refers to [genetic material of plant origin of actual or potential value for food and agriculture. <sup>18]</sup> [ <b>any genetic material of plant origin of actual or potential value for food and agriculture.</b> ” <sup>19]</sup> [These include] [ <b>This includes</b> ] farmers’ varieties/landraces maintained on-farm, improved varieties, breeding materials in crop improvement programmes, genebank accessions (i.e. <i>ex situ</i> collections), crop wild relatives and wild plants harvested for food.
		AnGR are genetic resources of animal origin [used or potentially used for food and agriculture.] [ <b>“used or potentially used for food and agriculture.”</b> ” <sup>20]</sup> [In line with the scope of previous global assessments, <sup>21</sup> the term is used in this document to refer to the genetic resources of domesticated avian and mammalian species used in food and agriculture.] [ <b>The scope of global assessments undertaken by FAO on animal genetic resources for food and agriculture was the genetic resources of domesticated avian and mammalian species used in food and agriculture.</b> ” <sup>22]</sup>

<sup>16</sup> CBD. 1992. *Convention on Biological Diversity*. Montreal, Canada, Secretariat of the Convention on Biological Diversity.

<sup>17</sup> FAO. 2019. *The State of the World’s Biodiversity for Food and Agriculture*. Rome.]

<sup>18</sup> FAO. 2010. *The Second Report on the State of the World’s Plant Genetic Resources for Food and Agriculture*. Rome (available at <http://www.fao.org/docrep/013/i1500e/i1500e.pdf>.)

<sup>19</sup> FAO. 2009. *International Treaty on Plant Genetic Resources for Food and Agriculture*. Rome.]

<sup>20</sup> FAO. 2007. *The State of the World’s Animal Genetic Resources for Food and Agriculture*. Rome; FAO. 2007. *The Global Plan of Action for Animal Genetic Resources and the Interlaken Declaration*. Rome.

<sup>21</sup> FAO. 2007. *The State of the World’s Animal Genetic Resources for Food and Agriculture*. Rome; FAO. 2015. *The Second Report on the State of World’s Animal Genetic Resources for Food and Agriculture*. Rome.

<sup>22</sup> FAO. 2007. *The State of the World’s Animal Genetic Resources for Food and Agriculture*. Rome; FAO. 2015. *The Second Report on the State of World’s Animal Genetic Resources for Food and Agriculture*. Rome.]

		Forest genetic resources (FGR)	[FGR are the heritable materials maintained within and among tree and other woody plant species that are of actual or potential economic, environmental, scientific or societal value.] <b>[FGR are “the heritable materials maintained within and among tree and other woody plant species that are of actual or potential economic, environmental, scientific or societal value.”]</b> <sup>23</sup>
		Aquatic genetic resources for food and agriculture (AqGR)	AqGR [are the genetic resources of aquatic animal and plant species used or potentially used in fisheries or aquaculture and the biodiversity of the associated ecosystems that support them.] <b>[“include DNA, genes, chromosomes, tissues, gametes, embryos and other early life history stages, individuals, strains, stocks and communities of organisms, of actual or potential value for food and agriculture.”]</b> <sup>24</sup> The scope of the global assessment undertaken for [the forthcoming report on] <i>The State of the World’s Aquatic Genetic Resources for Food and Aquaculture</i> [is] <b>[was]</b> farmed aquatic species and their wild relatives within national jurisdiction.
		Micro-organism and invertebrate genetic resources for food and agriculture <b>[(MIGR)]</b>	[Micro-organism and invertebrate genetic resources for food and agriculture are a major component of associated biodiversity.] <b>[MIGR are micro-organism and invertebrate genetic resources of actual or potential value for food and agriculture.]</b> Important groups include pollinators, in particular honey bees, micro-organisms of relevance to ruminant digestion, food processing and agro-industrial processes, biological control agents and soil micro-organisms and invertebrates. <sup>25</sup>
	Associated biodiversity		<p>[Associated biodiversity is a subcategory of biodiversity for food and agriculture that consists largely of non-domesticated species. Exceptions include the domestic honey bee, some other pollinator species and various biological control agents (natural enemies used to control pest species) that are bred in captivity. Where ecosystem services (see below) are concerned, associated biodiversity is particularly important to the supply of supporting and regulating services. Associated biodiversity species may also be direct sources of food and other products (provisioning ecosystem services) or have cultural significance (supply cultural ecosystem services).</p> <p>The concept is perhaps most familiar in the crop sector, where the biodiversity of harvested domesticated crop plants is distinguished from “crop-associated biodiversity” – the range of other species present in and around the production system that sustain ecosystem structures, functions and processes. Examples include pollinators, the predators of crop pests, the vegetation found in hedgerows and at field margins, and the invertebrates and micro-organisms that create and maintain the soil and its fertility. In addition to beneficial species such as pollinators, crop associated biodiversity includes the various species that inhibit crop production by acting as <b>[weeds or pests]</b> <b>[weeds, pests or diseases]</b>.</p> <p>In a livestock production system, for example, the domesticated animals can be distinguished from associated biodiversity such as rangeland plants, the micro-organism and invertebrate</p>

<sup>23</sup> FAO. 2014. *The State of the World’s Forest Genetic Resources*. Rome.

<sup>24</sup> [FAO. 2019. *The State of the World’s Aquatic Genetic Resources for Food and Agriculture*. Rome.]

<sup>25</sup> CGRFA/16/17/Report Rev.1, paragraph 79.

		<p>communities associated with these plants and with the soil, and the micro-organisms found in the animals' digestive systems. In a forest ecosystem, trees are surrounded by a multitude of plants, animals and micro-organisms that contribute in various ways to the functioning of the ecosystem. In capture fisheries, harvested species rely on a range of animals and plants and micro-organisms as sources of food and for services such as water purification and waste treatment. They benefit from oxygen provided by aquatic plants and the protection provided by habitats such as kelp forests, seagrass beds and coral reefs. Some species rely on others as hosts. Aquatic species farmed in extensive systems or raised in culture-based fisheries also interact with these various components of associated biodiversity. Similarly, species raised in aquaculture ponds benefit from a range of services provided by the flora and fauna that surround them, particularly with respect to water purification and nutrient cycling.</p> <p>Management of associated biodiversity encompasses a wide range of different intensities. Many components of associated biodiversity are not, in any deliberate way, managed to promote their role in supplying ecosystem services to food and agriculture (or subject only to broad measures targeting whole ecosystems). In other cases, habitats in and around production systems are deliberately managed in order to promote the presence of associated biodiversity species and thereby increase the supply of the ecosystem services they provide (e.g. management of hedgerows and field margins to support pollinators). In yet other cases, associated biodiversity species are deliberately introduced into production systems (e.g. introduction of biological control agents to address pest problems or soil micro-organisms to support plant nutrition).]</p> <p><b>[“Associated biodiversity comprises those species of importance to ecosystem function, for example, through pollination, control of plant, animal and aquatic pests, soil formation and health, water provision and quality, etc., including <i>inter alia</i>:</b></p> <p><b>a) Micro-organisms (including bacteria, viruses and protists) and fungi in and around production systems of importance to use and production such as mycorrhizal fungi, soil microbes, planktonic microbes, and rumen microbes;</b></p> <p><b>b) Invertebrates, including insects, spiders, worms, and all other invertebrates that are of importance to crop, animal, fish and forest production in different ways, including as decomposers, pests, pollinators, and predators, in and around production systems;</b></p> <p><b>c) Vertebrates, including amphibians, reptiles, and wild (non-domesticated) birds and mammals, including wild relatives, of importance to crop, animal, fish and forest production as pests, predators, pollinators or in other ways, in and around production systems;</b></p> <p><b>d) Wild and cultivated terrestrial and aquatic plants other than crops and crop wild relatives, in and around production areas such as hedge plants, weeds, and species</b></p>
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		<p><b>present in riparian corridors, rivers, lakes and coastal marine waters that contribute indirectly to production.”<sup>26]</sup></b></p>
	<p>Wild foods</p>	<p>Wild foods are food products obtained from non-domesticated species. They may be harvested (gathered or hunted) from within food and agricultural production systems or from natural or semi-natural ecosystems. The group of species that supplies wild foods overlaps to various degrees with those in the above-described “sectoral” categories of genetic resources. In the aquatic sector, the majority of production comes from wild foods and many aquaculture facilities use wild-caught stocks for broodstock or larval grow-out. Capture fisheries are probably the largest single example of the human use of wild foods.</p> <p><b>“Wild foods are food products obtained from non-domesticated species. They may be harvested (gathered or hunted) from within food and agricultural production systems or from other ecosystems. The group of species that supplies wild foods overlaps to various degrees with those in the ... ‘sectoral’ categories of genetic resources and with associated biodiversity. For example, capture fisheries are probably the largest single example of the human use of wild foods, and many aquaculture facilities use wild-caught stocks for broodstock or larval grow-out.”<sup>27</sup></b></p>
	<p>Ecosystem services</p>	<p>[Components of BFA provide ecosystem services.] Ecosystem services are “the benefits humans derive from ecosystems”.<sup>28</sup> The Millennium Ecosystem Assessment identified four categories of ecosystem service: provisioning, regulating, supporting and cultural. “Provisioning services” are “the products obtained from ecosystems”, i.e. food and raw materials of various kinds[, <b>including the products of food and agricultural systems</b>]. “Regulating services” are “benefits obtained from the regulation of ecosystem processes”. Examples include regulation of the climate, air and water quality, diseases and natural disasters. “Cultural services” are the “nonmaterial benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experiences”. “Supporting services” are services “that are necessary for the production of all other ecosystem services”. Examples include photosynthesis and nutrient cycling. The distinguishing feature of supporting services is that they have a less direct effect on human welfare.</p>

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<sup>26</sup> [FAO. 2013. *Guidelines for the preparation of the Country Reports for The State of the World’s Biodiversity for Food and Agriculture*. Rome.]

<sup>27</sup> [FAO. 2019. *The State of the World’s Biodiversity for Food and Agriculture*. Rome.]

<sup>28</sup> Millennium Ecosystem Assessment. 2005. *Ecosystems and human well-being: synthesis*. Washington DC, Island Press.

ALTERNATIVE TEXT:

[Table 1. Concepts used in the document

<b>Biodiversity</b>	<b>Biological diversity (often referred to as biodiversity) is defined in Article 2 of the Convention on Biological Diversity (CBD) as “the variability among living organisms from all sources including, <i>inter alia</i>, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part: this includes diversity within species, between species and of ecosystems”.</b> <sup>29</sup>
<b>Biodiversity for food and agriculture (BFA)</b>	<b>BFA is a subcategory of biodiversity taken for the purposes of <i>The State of the World’s Biodiversity for Food and Agriculture</i> to correspond to “the variety and variability of animals, plants and micro-organisms at the genetic, species and ecosystem levels that sustain the ecosystem structures, functions and processes in and around production systems, and that provide food and non-food agricultural products.”</b> <sup>30</sup> Production systems are here taken to include those in the crop, livestock, forest, fishery and aquaculture sectors.
<b>Plant genetic resources for food and agriculture (PGRFA)</b>	<b>The term PGRFA refers to “any genetic material of plant origin of actual or potential value for food and agriculture.”</b> <sup>31</sup> This includes farmers’ varieties/landraces maintained on-farm, improved varieties, breeding materials in crop improvement programmes, genebank accessions (i.e. <i>ex situ</i> collections), crop wild relatives and wild plants harvested for food.
<b>Animal genetic resources for food and agriculture (AnGR)</b>	<b>AnGR are genetic resources of animal origin “used or potentially used for food and agriculture.”</b> <sup>32</sup> The scope of global assessments undertaken by FAO on animal genetic resources for food and agriculture was the genetic resources of domesticated avian and mammalian species used in food and agriculture. <sup>33</sup>
<b>Forest genetic resources (FGR)</b>	<b>FGR are “the heritable materials maintained within and among tree and other woody plant species that are of actual or potential economic, environmental, scientific or societal value.”</b> <sup>34</sup>
<b>Aquatic genetic resources for food and agriculture (AqGR)</b>	<b>AqGR “include DNA, genes, chromosomes, tissues, gametes, embryos and other early life history stages, individuals, strains, stocks and communities of organisms, of actual or potential value for food and agriculture.”</b> <sup>35</sup> The scope of the global assessment undertaken for <i>The State of the World’s Aquatic Genetic Resources for Food and Aquaculture</i> was farmed aquatic species and their wild relatives within national jurisdiction.
<b>Micro-organism and invertebrate genetic resources for food and agriculture (MIGR)</b>	<b>MIGR are micro-organism and invertebrate genetic resources of actual or potential value for food and agriculture. Important groups include pollinators, in particular honey bees, micro-organisms of relevance to ruminant digestion, food processing and agro-industrial processes, biological control agents and soil micro-organisms and invertebrates.</b> <sup>36</sup>
<b>Associated biodiversity</b>	<b>“Associated biodiversity comprises those species of importance to ecosystem function, for example, through pollination, control of plant, animal and aquatic pests, soil formation and health, water provision and quality, etc., including <i>inter alia</i>:</b>

<sup>29</sup> CBD. 1992. *Convention on Biological Diversity*. Montreal, Canada, Secretariat of the Convention on Biological Diversity.

<sup>30</sup> FAO. 2019. *The State of the World’s Biodiversity for Food and Agriculture*. Rome.

<sup>31</sup> FAO. 2009. *International Treaty on Plant Genetic Resources for Food and Agriculture*. Rome.

<sup>32</sup> FAO. 2007. *The State of the World’s Animal Genetic Resources for Food and Agriculture*. Rome; FAO. 2007. *The Global Plan of Action for Animal Genetic Resources and the Interlaken Declaration*. Rome.

<sup>33</sup> FAO. 2007. *The State of the World’s Animal Genetic Resources for Food and Agriculture*. Rome; FAO. 2015. *The Second Report on the State of World’s Animal Genetic Resources for Food and Agriculture*. Rome.]

<sup>34</sup> FAO. 2014. *The State of the World’s Forest Genetic Resources*. Rome.

<sup>35</sup> FAO. 2019. *The State of the World’s Aquatic Genetic Resources for Food and Agriculture*. Rome.

<sup>36</sup> CGRFA/16/17/Report Rev.1, paragraph 79.

	<p>a) Micro-organisms (including bacteria, viruses and protists) and fungi in and around production systems of importance to use and production such as mycorrhizal fungi, soil microbes, planktonic microbes, and rumen microbes;</p> <p>b) Invertebrates, including insects, spiders, worms, and all other invertebrates that are of importance to crop, animal, fish and forest production in different ways, including as decomposers, pests, pollinators, and predators, in and around production systems;</p> <p>c) Vertebrates, including amphibians, reptiles, and wild (non-domesticated) birds and mammals, including wild relatives, of importance to crop, animal, fish and forest production as pests, predators, pollinators or in other ways, in and around production systems;</p> <p>d) Wild and cultivated terrestrial and aquatic plants other than crops and crop wild relatives, in and around production areas such as hedge plants, weeds, and species present in riparian corridors, rivers, lakes and coastal marine waters that contribute indirectly to production.”<sup>37</sup></p>
Wild foods	<p>“Wild foods are food products obtained from non-domesticated species. They may be harvested (gathered or hunted) from within food and agricultural production systems or from other ecosystems. The group of species that supplies wild foods overlaps to various degrees with those in the ... ‘sectoral’ categories of genetic resources and with associated biodiversity. For example, capture fisheries are probably the largest single example of the human use of wild foods, and many aquaculture facilities use wild-caught stocks for broodstock or larval grow-out.”<sup>38</sup></p>
Ecosystem services	<p>Ecosystem services are “the benefits humans derive from ecosystems”.<sup>39</sup> The Millennium Ecosystem Assessment identified four categories of ecosystem service: provisioning, regulating, supporting and cultural. “Provisioning services” are “the products obtained from ecosystems”, i.e. food and raw materials of various kinds, including the products of food and agricultural systems. “Regulating services” are “benefits obtained from the regulation of ecosystem processes”. Examples include regulation of the climate, air and water quality, diseases and natural disasters. “Cultural services” are the “nonmaterial benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experiences”. “Supporting services” are services “that are necessary for the production of all other ecosystem services”. Examples include photosynthesis and nutrient cycling. The distinguishing feature of supporting services is that they have a less direct effect on human welfare.</p>

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<sup>37</sup> FAO. 2013. *Guidelines for the preparation of the Country Reports for The State of the World’s Biodiversity for Food and Agriculture*. Rome.

<sup>38</sup> [FAO. 2019. *The State of the World’s Biodiversity for Food and Agriculture*. Rome.]

<sup>39</sup> Millennium Ecosystem Assessment. 2005. *Ecosystems and human well-being: synthesis*. Washington DC, Island Press.