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# COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

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

## Second Part of the Second Meeting

## 25–27 May 2021

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

### Note from the Secretariat

1. The Commission on Genetic Resources for Food and Agriculture, at its 17th Regular Session, requested the Secretary to convene an open-ended Second Meeting of the Group of National Focal Points for Biodiversity for Food and Agriculture (Group of National Focal Points) to review and, as appropriate, revise the document *Biodiversity for Food and Agriculture – Revised Draft Needs and Possible Actions*[1].

2. The Group of National Focal Points started the review during the first part of its Second Meeting that was held from 2 to 4 March 2021.[2] The draft text, as reviewed by the Group of National Focal Points, is contained in *Appendix I* to this document.

3. The Group of National Focal Points may wish to:

a) Review and revise, as appropriate, the document contained in *Appendix I* to this document, for consideration by the Commission at its next session;

b) Recommend that the Commission finalize and approve the document and invite the Director-General to bring it to the attention of the Conference with a view to its being adopted;

c) Recommend that the Commission request FAO to assist Members in the implementation and monitoring of the possible actions contained in the document.

[1] CGRFA-17/19/Report, Appendix C.
[2] CGRFA/NFP-BFA-2/21/2 and CGRFA/NFP-BFA-2.1/21/Report.

# APPENDIX I

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

## I. [Introduction

1. Biodiversity for food and agriculture (BFA), along with the ecosystem services it supports, is essential to sustainable agriculture and food systems. It 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 also contributing to environment protection and restoration and sustainable use.

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 plant, animal, forest and aquatic genetic resources and adopted global plans of action for the first three of these sectors (referred to in this text as the "sectoral global plans of action").[3] 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 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. *The State of the World's Biodiversity for Food and Agriculture* was published in February 2019.[4]

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 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*.

5. This document identifies needs and [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

[3] 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. 2019. *The State of the World's Aquatic Genetic Resources for Food and Agriculture*. Rome.

[4] FAO. 2019. *The State of the World's Biodiversity for Food and Agriculture*. Rome.

and non-food agricultural products".[5] "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. Concepts used in the document are described, in detail, in Annex 1.**]**

## II. Rationale

6. BFA, i.e. biodiversity that in one way or another contributes to agriculture and food production, is indispensable to food security, nutrition and health, 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[6] 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 the respective sectors 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 a need to manage the various components of BFA in a more systematic and integrated way and go beyond sector-specific strategies. 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. Such approaches must consider that agricultural production systems [and agro-ecosystems] also produce ecosystem services that are relevant to, and can be positive for, enhancing our environments and well-being.

7. Key findings of the report on *The State of the World's Biodiversity for Food and Agriculture* include the following[7]:

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

- Many components of BFA at genetic, species and ecosystem levels are key to the current and future productivity of all agricultural sectors.
- Plant, animal, aquatic and micro-organism and invertebrate genetic resources for food and agriculture and forest genetic resources – and their diversity at species, and within-species (variety, breed, strain, etc.) 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 present in and around productions 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.
- 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

[5] FAO. 2019. *The State of the World's Biodiversity for Food and Agriculture*. Rome.
[6] Conservation of biodiversity is the protection, preservation, management, or restoration of biodiversity.
[7] FAO, 2019. *The State of the World's Biodiversity for Food and Agriculture – In brief*. Rome.

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 [may give rise]/[are giving rise to] [negative] drivers [of biodiversity loss] at production-system level such as land-use change, inappropriate use of external inputs, overharvesting [of wild biodiversity,] 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 and the complementarity between these approaches needs to be enhanced.

***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 GRFA 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.

8. The sustainable use and conservation of BFA [while contributing to the livelihoods and well-being of many people in the world] face numerous challenges. BFA cannot be managed effectively if its components are considered in isolation from each other. A system approach is needed in order to allow the full benefit of BFA in terms of promoting transition towards more sustainable and resilient food and agriculture systems to be realized. 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 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*. To complement the sectoral GPAs, a strong emphasis is placed on actions that seek to further improve knowledge of BFA, in particular of components, such as associated biodiversity [and wild foods] [and corresponding agro-ecosystems,]/[and agro-ecosystems]/[and ecosystem services]**,** 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.

## III. 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

12. This document aims to:

- create a contextual framework for the coherent and consistent implementation of the Commission's sectoral global plans of action and for the sustainable use and conservation of BFA including associated biodiversity and wild foods -, as a basis for food security,

nutrition and health, sustainable food and agriculture, and poverty reduction and livelihoods;

- promote transition towards more sustainable agriculture and food systems;
- 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]/[including] associated biodiversity and wild foods, and the ecosystem services it provides among all stakeholders, from producers to consumers and policy-makers;
- promote the sustainable use and conservation of BFA, [in particular]/[including] associated biodiversity and wild foods, within [agro-ecosystems and other]/[production systems and other] terrestrial and aquatic ecosystems, as a basis for ecosystem services and resilience, [in order to foster economic development and reduce [malnutrition,] hunger and poverty, particularly in developing countries,] as well as to provide options for adapting to and mitigating climate change;
- set the conceptual basis 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, information-sharing and technology transfer and enhance institutional capacity, including in research, education and training 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;

**Option 1**

- [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.[8]]

**Option 2**

- [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, by reducing 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.[9]]

13. 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.

## V. Operative principles

[8] CL 163/11 Rev.1.
[9] CL 163/11 Rev.1.

14. 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]/[ traditional local knowledge and practices] should be taken into consideration. Participatory [and inclusive] research [and innovation] approaches, should be utilized [[and promoted], 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 actions should promote the participation of all food producers, giving special attention to the needs of family-based and smallholder agriculture, forestry, fisheries and aquaculture, and giving special attention to the needs of developing countries.
- 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 and should involve the effective participation of women.
- 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 and should involve the effective participation of indigenous peoples and local communities.

## VI. Structure and organization

15. 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: Characterization, assessment and monitoring of biodiversity for food and agriculture

Strategic Priority Area 2: Management of biodiversity for food and agriculture

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

16. The [possible] actions are not listed in order of priority, as the relative priority of each [possible] action and associated timelines may vary significantly across countries and regions. Relative priority may depend on 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. When a list of practices or approaches is presented within an action, it is intended to be non-prescriptive and non-exhaustive. There is no one-size-fits-all solution and case-by-case analyses are needed.

17. For each strategic priority area, an introduction presents the needs identified on the basis of the country reports prepared as contributions to *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: CHARACTERIZATION, 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

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

**2.2** Improve conservation of biodiversity for food and agriculture

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

**3.1** Build capacity through awareness raising, research, education and training

**3.2** Strengthen legal, policy and incentive frameworks

**3.3** Improve cooperation and funding

## STRATEGIC PRIORITY AREA 1: CHARACTERIZATION, ASSESSMENT AND MONITORING OF BIODIVERSITY FOR FOOD AND AGRICULTURE

### Introduction

The characterization, assessment and monitoring of BFA 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 targeted by capture fisheries) – inventories and other information exist, although to varying degrees across the regions of the world and across food and agriculture sectors. At global level, monitoring systems for sectoral 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 global information system on forest genetic resources.

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 or documented. Population trends are relatively well 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. Fundamental taxonomic knowledge to assess biodiversity is declining.

There are also many gaps in knowledge on the characteristics and the status and trends of species that are sources of wild foods, including on risks associated with spillover of zoonotic and other pathogens.

In many cases, the contributions of components of BFA to the supply of ecosystem services are poorly understood, as are the effects of particular drivers 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, sharing and analysing data (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.

### [Strategic] Priority 1.1 Improve availability of, and access to, information on biodiversity for food and agriculture

### Rationale

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.[10] These include specific production practices and approaches (e.g. conservation agriculture, pollination[-friendly practices and] management, [permaculture,] 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.

**[Possible] Actions**

**Option 1**[1.1.1 **[CONSOLIDATE ALL ACTIONS REFERRING TO SECTORAL GPAs (1.1.1, 2.1.1, 2.2.1, 3.1.1, 3.2.1) UNDER THE OPERATIVE PRINCIPLES]** Promote[, and support when needed,] the implementation at all levels, of the sectoral global plans of action to improve assessment and monitoring of the respective genetic resources, as appropriate.

1.1.2 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 [on the one hand, and between them and other relevant sectors on the other (e.g. energy, textiles, tourism),] are taken into account and that synergies are promoted and duplication of efforts [minimized]/[avoided.]]

**Option 2**

[**MERGE 1.1.1 and 1.1.2** Promote the implementation at all levels, of the sectoral global plans of action provisions to improve characterization, assessment and monitoring of the respective genetic resources.]

1.1.3 Improve the inventory and characterization of associated biodiversity and wild foods. [Monitor changes in their populations and distributions over time[, including those with potential for zoonotic or other pathogen spillover.]]

1.1.4 Improve the assessment of how BFA, [in particular]/[including] 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[, indigenous and local community] knowledge, as relevant, and the characteristics of [local] production systems. [Monitor changes in levels of adoption of relevant management practices over time.]

**Option 1**

[1.1.5 Improve the assessment of drivers of change and their effects on [all components of] BFA, [[in particular]/[including] associated biodiversity and wild foods], including on population sizes and distributions, and on the ecological relationships that underpin the supply of ecosystem services[, including those from production systems]. [Monitor changes in relevant drivers over time.]

[1.1.6 For all components of BFA, take action to reduce knowledge gaps on their roles in the supply of ecosystem services, including on how [management practices in the food and agriculture sector affect drivers of change and their effect on the components of BFA and their roles in the supply of ecosystem services] [these roles are influenced by management practices in the food and agriculture sector]. [Monitor relevant [ecosystems]/[production systems] for changes in the supply of ecosystem services over time.]]

**Option 2**

**[MERGE 1.1.5 and 1.1.6]**

[10] 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.

1.1.7 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, nutrition and health, including gaps in knowledge related to cultural and social aspects of their use. [Monitor changes in consumption over time.]

[1.1.8 **[MOVE PARAGRAPH TO SP3]** [Enhance national frameworks]/[Assign responsibilities] for the assessment and monitoring of associated biodiversity and wild foods. [Help to develop and strengthen the institutional structures and or agencies relating to evaluation and monitoring of associated biodiversity and wild food that could be responsible for coordinating and supervising activities at national level.] This could involve [mandating a national agency]/[engaging national agencies and strengthening interagency coordination] [, as appropriate and practical] (e.g. from the agriculture or environment sectors or an intersectoral agency) to undertake, or to coordinate and oversee, monitoring activities[.] [,taking into account available means and pre-existing initiatives.]]

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

[1.1.10 **[MERGE WITH 3.1.4]** For aspects of the assessment and monitoring of BFA, strengthen [involvement of [citizen scientists]/[citizen science]]/[participatory research approaches], as appropriate.]

1.1.11 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[, taking into account national circumstances and the need to avoid adding unnecessary reporting burden.]

1.1.12 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*bis* Support the development of international reference tools and protocols for inventory, assessment and monitoring of BFA.]

[1.1.13 **[MOVE TO SP3.3]** Support, [including via funding,] [the improvement of]/[the strengthening of existing or the development of new] 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.]]

[1.1.14 **[MOVE TO SP3]** Strengthen capacity to use assessment and monitoring systems, including by improving the dissemination of information to users.]

**[Strategic Priority 1.2 Monitoring and assessment of biodiversity for food and agriculture contribution to food security, nutrition and ecosystem services]**

## STRATEGIC PRIORITY AREA 2: [INTEGRATED] MANAGEMENT OF BIODIVERSITY FOR FOOD AND AGRICULTURE

### 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.[11]]

*In situ* conservation of BFA [also] comprises measures taken to promote [the maintenance][, protection][, restoration] 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 [or seed banks].Managing BFA more sustainably will require efforts to address threats [and drivers of biodiversity loss and ecosystem degradation] 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).

[11] 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.

**[Strategic] Priority 2.1 Promote integrated approaches to the [management]/[sustainable use] of biodiversity for food and agriculture**

**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, [outreach, awareness raising,] 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**

**[MOVE INTO 2.1: 2.2.5, 2.2.6, 2.2.7, 2.2.9 and 3.2.12]**

[2.1.1 [Support and promote]/[Promote] the implementation, at all levels, of the sectoral global plans of action to improve management of the respective genetic resources, as appropriate.

2.1.2 **[MERGE 2.1.1 and 2.1.2]** 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[ avoided]/[minimized.]]

2.1.3 When developing or implementing approaches to the management of BFA, identify and take into account drivers of change affecting BFA and associated ecosystem services[ and promote practices that enhance sustainable use and conservation of biodiversity].

[2.1.4 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]/[soil health] 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, [control and management of invasive alien species] 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*bis* Promote measures to reduce the risks to and impacts on BFA from the [inappropriate] use of chemical pesticides and veterinary medicines and from the excess use of fertilizers.]

[2.1.4*ter* Promote measures to reduce the risk and impact of overgrazing and to enhance and promote best practices in rangeland management.]

[2.1.4*quater* Support the integration of biodiversity into food value chains from conservation to production to marketing and consumption.][12]

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

The text below was not negotiated by the Group of National Focal Points during the first part of its Second Meeting. Paragraphs marked with an asterisk (*) were identified during the meeting as those to which delegates had no substantive amendments to make.

2.1.6 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.

2.1.7 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).

**[Strategic] Priority 2.2 Improve conservation of biodiversity for food and agriculture**

**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.

[12] * proposed by an international organization.

**[Possible] Actions**

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

2.2.2 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.

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

2.2.4 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.

2.2.5 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.

2.2.6 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.

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

*2.2.8 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.

2.2.9 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.

2.2.10 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.

2.2.11 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.

2.2.12 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

### 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.

**[Strategic] Priority 3.1** Build capacity through awareness raising, research, education and training

**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.[13]

*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**

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 the respective genetic resources and build capacity to strengthen research, education and training for their sustainable use and conservation, as appropriate.

3.1.2 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.

3.1.3 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.

*3.1.4 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.

3.1.5 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.

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.

3.1.7 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

[13] Citizen science refers here to the collection of data relating to biodiversity by the general public.

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 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.

**[Strategic] 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 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, into national accounting systems or into broader measures of social welfare is limited, and major knowledge gaps remain, including with respect to microbial genetic resources, wild pollinators and wild medicinal plants. 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.

*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 and other sectors. Overall, there is also a need to better document and map economic instruments that are used, or could be used, to promote the sustainable management of BFA.

**[Possible] Actions**

3.2.1 Promote the implementation, at all levels, of the sectoral global plans of action to strengthen institutions and policy frameworks for the respective genetic resources, as appropriate.

3.2.2 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.

3.2.3 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.

3.2.4 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.

3.2.5 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.

3.2.6 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.

3.2.7 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.

3.2.8 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.

3.2.9 Promote the integration of the outcomes of economic analyses, including valuation studies, into conservation strategies and other aspects of BFA management.

3.2.10 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.

3.2.11 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.

3.2.12 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.

3.2.13 Eliminate incentives harmful to biodiversity.

3.2.14 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.

3.2.15 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.

3.2.16 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.

3.2.17 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.

**[Strategic] Priority 3.3 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. 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. 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. 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.

*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**

3.3.1 Inventory and describe national and regional institutions with mandates related to the management of BFA to enable the establishment or strengthening of relevant coordination mechanisms.

3.3.2 Improve cooperation between producers, researchers, consumers and policy-makers within the sectors of agriculture and more widely, in order to facilitate the development of more relevant and effective BFA-related policies.

3.3.3 Promote existing and/or establish new national, regional or global networks linking scientists, researchers and other stakeholders to improve 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 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.

3.3.6 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.

3.3.7 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.

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

3.3.9 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

**Table 1.** Concepts used in the document

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| Biodiversity | Biological diversity (often referred to as biodiversity) is defined in Article 2 of the Convention on Biological Biodiversity (CBD) as "the variability among living organisms from all sources including, *inter alia*, 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".[14] |
| *Biodiversity for food and agriculture (BFA) | BFA is a subcategory of biodiversity taken for the purposes of *The State of the World's Biodiversity for Food and Agriculture* 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." [15] Production systems are here taken to include those in the crop, livestock, forest, fishery and aquaculture sectors. |
| *Plant genetic resources for food and agriculture (PGRFA) | The term PGRFA refers to "any genetic material of plant origin of actual or potential value for food and agriculture." [16] This includes farmers' varieties/landraces maintained on-farm, improved varieties, breeding materials in crop improvement programmes, genebank accessions (i.e. *ex situ* collections), crop wild relatives and wild plants harvested for food. |
| Animal genetic resources for food and agriculture (AnGR) | AnGR are genetic resources of animal origin "used or potentially used for food and agriculture." [17] 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. [18] |
| *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."[19] |
| Aquatic genetic resources for food and agriculture (AqGR) | 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."[20] The scope of the global assessment undertaken for *The State of the World's Aquatic Genetic Resources for Food and Aquaculture* was farmed aquatic species and their wild relatives within national jurisdiction. |
| Micro-organism and invertebrate genetic resources for food and agriculture (MIGR) | 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.[21] |
| Associated biodiversity | "Associated biodiversity comprises those species of importance to ecosystem function, for example, through pollination, control of plant, animal and aquatic |

[14] CBD. 1992. *Convention on Biological Diversity.* Montreal, Canada, Secretariat of the Convention on Biological Diversity.
[15] FAO. 2019. *The State of the World's Biodiversity for Food and Agriculture.* Rome.
[16] FAO. 2009. *International Treaty on Plant Genetic Resources for Food and Agriculture.* Rome.
[17] 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.
[18] 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.
[19] FAO. 2014. *The State of the World's Forest Genetic Resources.* Rome.
[20] FAO. 2019. *The State of the World's Aquatic Genetic Resources for Food and Agriculture.* Rome.
[21] CGRFA/16/17/Report Rev.1, paragraph 79.

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| | pests, soil formation and health, water provision and quality, etc., including inter alia:<br>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;<br><br>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;<br><br>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;<br><br>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." [22] |
| Wild foods | "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."[23] |
| Ecosystem services | Ecosystem services are "the benefits humans derive from ecosystems". [24] 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. |

[22] FAO. 2013. *Guidelines for the preparation of the Country Reports for* The State of the World's Biodiversity for Food and Agriculture. Rome.
[23] FAO. 2019. *The State of the World's Biodiversity for Food and Agriculture*. Rome.
[24] Millennium Ecosystem Assessment. 2005. *Ecosystems and human well-being: synthesis.* Washington DC, Island Press.