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Organization of the
United Nations**

COMMISSION ON
GENETIC RESOURCES
FOR FOOD AND
AGRICULTURE



BIODIVERSITY FOR FOOD AND AGRICULTURE

FREQUENTLY ASKED QUESTIONS

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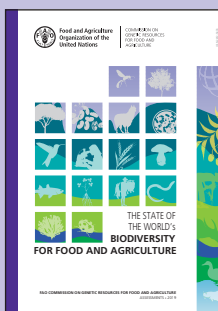
INTRODUCTION

Biodiversity for food and agriculture is declining: what does this mean? What can I do about it?

The issue of biodiversity loss is attracting increasing attention worldwide. Yet, information related to biodiversity, particularly in the context of food and agriculture, can be challenging to communicate.

Based on information found in FAO's report on *The State of the World's Biodiversity for Food and Agriculture* (see box), this document provides simple answers to key questions about biodiversity for food and agriculture (or just BFA):

- *What is biodiversity for food and agriculture?*
- *Why is biodiversity for food and agriculture important?*
- *What are the trends in biodiversity for food and agriculture?*
- *What are the threats to biodiversity for food and agriculture?*
- *Is management of biodiversity for food and agriculture getting better?*
- *How can we better manage biodiversity for food and agriculture?*
- *Why is international cooperation important and what is the role of the Commission?*
- *How can I help support biodiversity for food and agriculture?*



The first report on *The State of the World's Biodiversity for Food and Agriculture* (FAO, 2019), was prepared under the guidance of FAO's Commission on Genetic Resources for Food and Agriculture through a participatory, country-driven process, engaging over 175 authors and reviewers, who based their analysis on 91 country reports prepared by over 1 300 contributors. It describes the many benefits that biodiversity brings to food and agriculture, examines how farmers, pastoralists, forest dwellers, fishers and

fish farmers have shaped and managed biodiversity, identifies major drivers of trends in the status of biodiversity, and discusses trends in the use of biodiversity-friendly production practices.

WHAT IS BIODIVERSITY FOR FOOD AND AGRICULTURE?



Bumblebees, livestock breeds, mountain forests and the bacteria that make yoghurt might seem to have little in common. But they are all biodiversity for food and agriculture: that part of biodiversity – by which we mean ecosystems, species and the genetic variation within individual species – that helps supply our food and agricultural products.

Biodiversity for food and agriculture ranges from crops and livestock, through wild plants and animals used as food, to the multitude of species and ecological processes supporting food security in less obvious ways. These include pollinators, predators of pests, beneficial soil life, micro-organisms that process food, and many more. Thus, biodiversity for food and agriculture embraces a bewildering mixture: cows, rice, apples, cassava, both wild and farmed salmon, bees that pollinate crops, species like ladybirds that eat damaging aphids, earthworms that create healthy soil, bamboo, rattan and pine trees, local fruit varieties, drought-resistant crop varieties and the bacteria that produce fermented milk products. Ecosystems in and around farms or that otherwise support food and agricultural production are included, for example woodland that buffers farms against wind erosion of soils.

Understanding biodiversity for food and agriculture therefore requires knowledge of how different types of biodiversity interact and influence agriculture and food production. It is a rather fuzzy concept, and we still have a lot to learn.

WHY IS BIODIVERSITY FOR FOOD AND AGRICULTURE IMPORTANT?



Biodiversity for food and agriculture is the cornerstone of global food security. It is not an optional extra. It includes the crops and livestock that are the main basis of our diets, as well as a multitude of wild species that contribute to our food and material supplies.

Wild fish provide 90 million tonnes of food a year and are the main source of protein for many coastal communities. Wild foods from forests and other terrestrial habitats are important sources of nutrition for millions of people, in many cases helping to keep them fed during lean seasons and providing insurance against crop failure.

The world's agriculture relies on irrigation water from healthy, functioning ecosystems, on stable and healthy soils, and on the insects, bats and birds that pollinate crops and provide biological control of pests. In parts of China collapsing insect populations mean growers pollinate crops by hand, using a paintbrush. Micro-organisms drive much of the world's vast food-processing industry, from traditional crop fermentation in village dwellings to yoghurt making by gigantic food companies. Crop wild relatives support efforts to breed for resilience against emerging crop diseases and climate change. Home gardens supplement the diets of billions of people.

The genetic diversity in crop varieties and livestock breeds means we can enjoy a wider variety of flavours and textures in our food, and allows food to be produced in many different climates, soil types and environmental conditions.

Many farmers consciously work with nature, drawing on benefits from well-managed ecosystems. These approaches also avoid many damaging impacts – from pollution, soil erosion and loss of usable irrigation water – that otherwise undermine agriculture. biodiversity for food and agriculture is not just important; it is irreplaceable.

WHAT ARE THE TRENDS IN BIODIVERSITY FOR FOOD AND AGRICULTURE?



All evidence suggests that both wild and domesticated biodiversity for food and agriculture is declining, although there are still huge gaps in our knowledge.

Generally, as farming becomes specialized, traditional livestock breeds and crop varieties are abandoned, and some threatened with extinction; at least 28 percent of local livestock breeds are at risk. Food production is heavily based on a small number of species: two-thirds of global crop production comes from just nine species and 97 percent of meat production from eight species.

Among wild biodiversity for food and agriculture, almost a third of ocean fish stocks are overfished, a third of freshwater fish are at risk of extinction, and close to a fifth of species recorded in the IUCN Red List of Threatened Species as sources of human food are classed as threatened.

Key ecosystems that support food and agriculture (ecosystems are part of biodiversity) are also disappearing, along with associated biodiversity such as pollinators. Despite global concern about deforestation, forest loss continues at a high rate. Wetlands are drained and polluted. Climate change damages ecosystems that support food and agriculture, for example leading to drier weather that threatens tropical mountain cloud forests that supply irrigation water.

Our ability to react to these losses is hampered by lack of knowledge about many less obvious parts of biodiversity for food and agriculture. While scientists know virtually every individual wild tiger left alive, less than 1 percent of bacteria species have even been identified, yet many play irreplaceable roles in food production. Monitoring of biodiversity for food and agriculture is still all but absent in many countries. Getting a better handle on trends in biodiversity for food and agriculture is one of the first priorities for ensuring more sustainable management.

WHAT ARE THE THREATS TO BIODIVERSITY FOR FOOD AND AGRICULTURE?



Threats come at many levels and are often interconnected. The biggest threat of all is probably habitat loss and the relentless conversion of natural forests, grassland, savannah, wetlands and coastal habitats. Agriculture is the largest driver of these losses: through clearing native vegetation to create farmland and ranches, by upsetting water cycles and through pesticide and fertilizer pollution. Farming is also a major source of greenhouse gases. Impacts rebound on farming, undermining its own sustainability, reducing useful wild species like pollinators, disrupting irrigation and accelerating climate change.

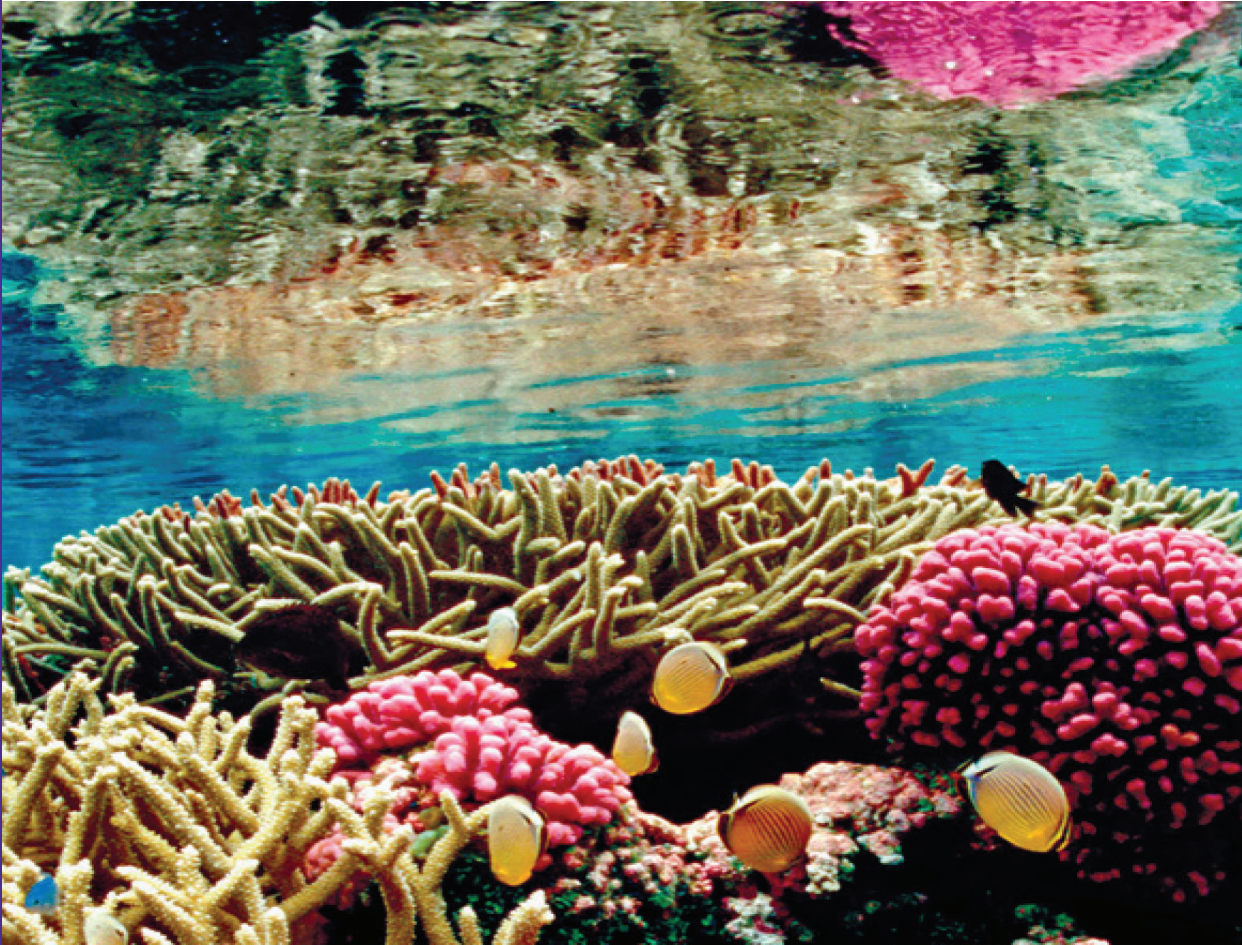
Ecosystem loss also destroys the wild foods that many poor people depend upon, along with other critical ecosystem services. Many wild food sources are themselves overexploited, creating food shortages and extinction threats.

Climate change influences virtually everything, upsetting farming cycles, increasing extreme weather and undermining ecosystems. Climate-related disasters can be devastating: floods, droughts and fires destroy farming systems and wild food sources, putting human communities at imminent risk. Invasive species, spreading as a result of globalization, destroy valuable local species and degrade ecosystems.

Many of these pressures are driven by larger social trends: population growth, market strategies of large corporations and socio-economic and cultural changes such as increasing consumption and a boom in meat-eating.

Agricultural intensification has reduced crop and livestock diversity, with production strategies and marketing policies focusing on a few key products, thus reducing opportunities for adaptation, and incidentally denying consumers the multiple tastes of traditional fruit and vegetable varieties.

IS MANAGEMENT OF BIODIVERSITY FOR FOOD AND AGRICULTURE GETTING BETTER?



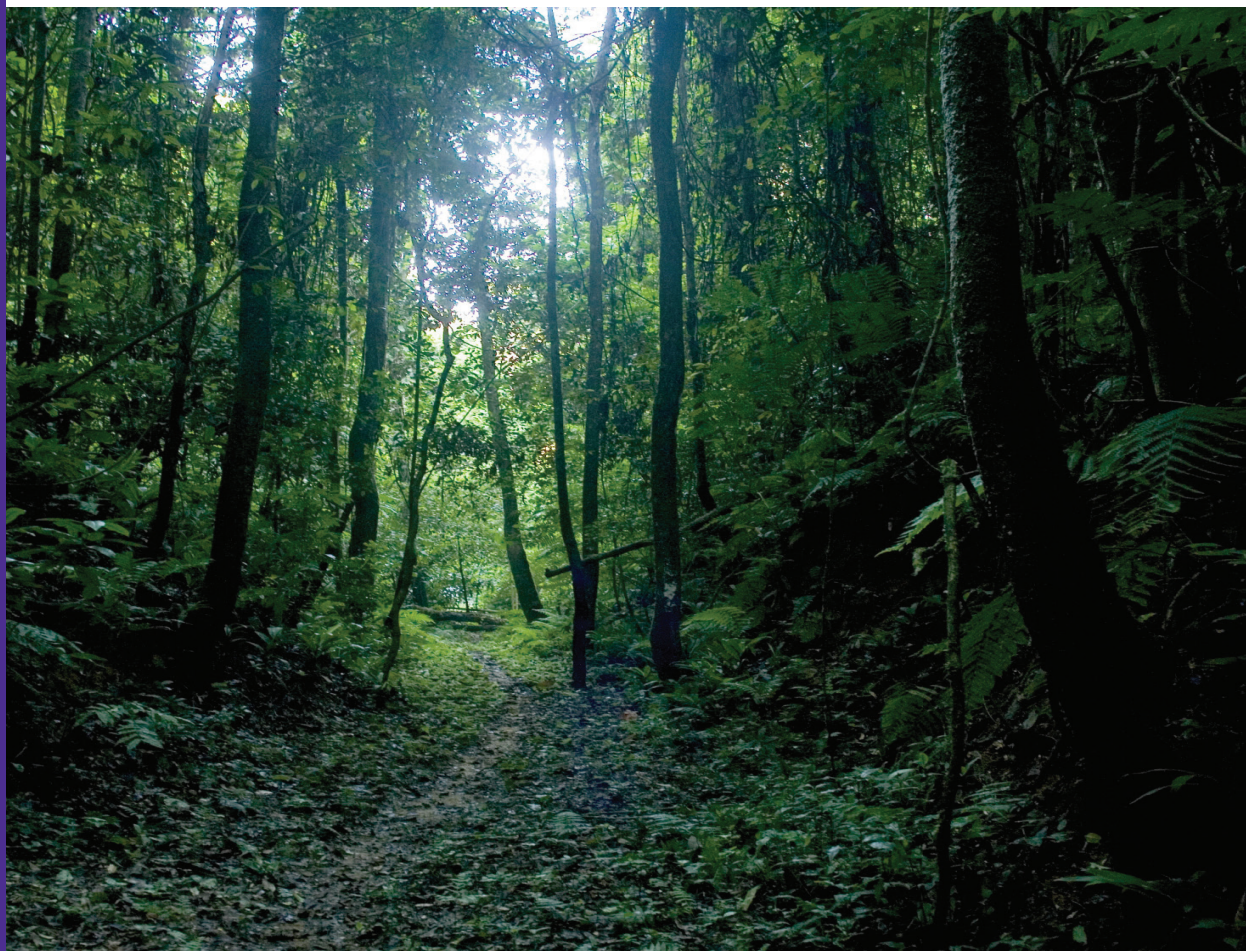
It is hard to be sure. Countries report that biodiversity-friendly practices such as sustainable soil management, pollinator enhancement and coral-reef restoration are increasing. But whether this has made any real differences to biodiversity for food and agriculture is difficult to measure.

Specific biodiversity-friendly management practices are more frequently reported from richer countries. On the other hand, many farmers in the poorest countries may be unable to afford to buy the pesticides and fertilizers that tend to harm biodiversity for food and agriculture.

Biodiversity-friendly management systems are often more complicated, relying on a detailed understanding of local environmental conditions and sometimes needing extra work, factors that can constrain their introduction. Bringing biodiversity-friendly approaches into mainstream agriculture is an urgent priority in the immediate future to secure valuable biodiversity for food and agriculture before it is too late.

Generally, both wild and domesticated biodiversity (ecosystems, species and genetic variation within species) are best conserved in their normal habitats or on farm (known as *in situ*) rather than in seed or gene banks, zoos, botanic gardens, aquaria or arboreta (known as *ex situ*). However, *ex situ* conservation is vital as an insurance policy against extinction in the wild and the loss of rare breeds and varieties from farms and as a source of material for crop and livestock breeding. *In situ* conservation has many aspects. It can include promoting the cultivation of traditional crops and keeping of local breeds, setting up protected areas to maintain useful wild biodiversity for food and agriculture, introducing management controls on fishing and other uses of wild biodiversity for food and agriculture, and sometimes restoring damaged and degraded ecosystems. There are still huge gaps in conservation efforts; for example, only a small proportion of threatened wild food species have conservation programmes.

HOW CAN WE BETTER MANAGE BIODIVERSITY FOR FOOD AND AGRICULTURE?



Effective management of biodiversity for food and agriculture involves many different activities. All centre in one way or another around minimizing losses to biodiversity for food and agriculture and maximizing the potential benefits from its sustainable use.

Threats to biodiversity from habitat destruction, climate change and pollution need to be addressed. Sustainable management strategies need to be agreed for wild-collected species. Diversifying production and cutting pesticide and fertilizer pollution to prevent ecosystem degradation are also important, drawing on the many low-input and organic approaches available. Area-based conservation – national parks and nature reserves, for example – plays a key role in maintaining the healthy ecosystems that support food security.

Active protection for the genetic diversity in domesticated species is key – on farms and using seed and gene banks or rare breed centres. Conservation of crop and livestock wild relatives in natural ecosystems is also vital. Breeding programmes for crops, livestock and farmed aquatic species need to be well planned, so that they maintain a sufficient level of genetic diversity and produce plant and animal populations that are well suited to production conditions and the needs of producers.

Good management involves addressing trade-offs: balancing the roles of natural ecosystems with the need for more farmland, controlling crop pests without destroying the pests' predators, maintaining fish stocks without impoverishing fishing communities, etc. There is still a lot to be learned, both by scientists and through working with local and indigenous communities to capture traditional knowledge about everything from adapting crops to climate change to improving fermentation in food preparation. Managing biodiversity for food and agriculture is often very location specific.

People at every level of food production and consumption have a role to play in encouraging and driving the sustainable management of biodiversity for food and agriculture.

WHY IS INTERNATIONAL COOPERATION IMPORTANT AND WHAT IS THE ROLE OF THE COMMISSION?



The crisis threatening biodiversity for food and agriculture requires global cooperation to support its sustainable use and conservation, for example by addressing crossborder threats, collaborating in the management of migratory species, and coordinating research and information sharing. International exchange of genetic resources is vital to food and agriculture, and cooperation is needed to ensure that this is done efficiently, fairly and equitably.

FAO's Commission on Genetic Resources for Food and Agriculture is the only permanent intergovernmental body that specifically addresses biodiversity for food and agriculture. The Commission was established in 1983 to deal with the genetic resources of crop plants. In 1995 its mandate was extended to cover all types of biodiversity of relevance to food and agriculture. Leading up to 2004, it negotiated the International Treaty on Plant Genetic Resources for Food and Agriculture. As of 1 October 2020, 178 countries and the European Union are Commission members and many organizations attend meetings as observers.

The Commission oversees the preparation of periodic global assessments of plant, animal, forest and aquatic genetic resources, negotiates policy responses to them, and develops technical guidelines, codes of conduct and other tools to support countries. As of 2020, it has agreed Global Plans of Action for Plant, Animal and Aquatic Genetic Resources for Food and Agriculture and for Forest Genetic Resources (FAO, 2007; 2011; 2014; 2022a).

The State of the World's Biodiversity for Food and Agriculture (FAO, 2019) presents a first global assessment of the status and trends of all biodiversity for food and agriculture. In 2021, the Commission agreed a policy response, the Framework for Action on Biodiversity for Food and Agriculture (FAO, 2022b), which presents a set of integrated and interlinked actions for the sustainable use and conservation of biodiversity for food and agriculture.

The Commission doesn't just address the work of governments, but recognizes – and seeks to facilitate – the contributions that farmers, forest dwellers, pastoralists, animal breeders, fisherfolk and local and indigenous communities make to the management of biodiversity for food and agriculture, for example by maintaining knowledge and the lifestyles and agro-ecosystems that support biodiversity for food and agriculture.

HOW CAN I HELP SUPPORT BIODIVERSITY FOR FOOD AND AGRICULTURE?



We all make daily decisions that affect biodiversity for food and agriculture. Farmers, shopkeepers, teachers, hobby gardeners, conservation volunteers, voters and consumers all have a role to play.

Choosing food from credible, nature-friendly systems, such as organic agriculture, free-range poultry farms or sustainable fisheries, supports producers who are trying to help biodiversity for food and agriculture. Finding out about local crop varieties and livestock breeds and buying their products from orchards or markets can support biodiversity for food and agriculture by helping to keep threatened varieties and breeds in use. Sometimes biodiversity-friendly products cost more and will not be available to all. But anyone can ask shopkeepers where their food comes from or contact food manufacturers to ask if their products are sustainably produced. When companies know enough of their customers care they will start to make changes. The same is true for schools, workplaces and local governments; a message that people want sustainable, local food will make a difference.

People with a garden, backyard or windowsill can grow some of their own food and help to rebuild insect populations by choosing plants that attract beneficial insects and by reducing or cutting out pesticide use. Building a special “bug house” with places for insects to live and breed can boost numbers and is really useful in a school, where it can be used for teaching. Conservation groups seek volunteers for projects like woodland or wetland restoration that provide valuable ecosystem services to food producers, and many monitoring schemes depend on citizen scientists.

Conserving biodiversity for food and agriculture is not just a job for governments, but an urgent priority where everyone can help.

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