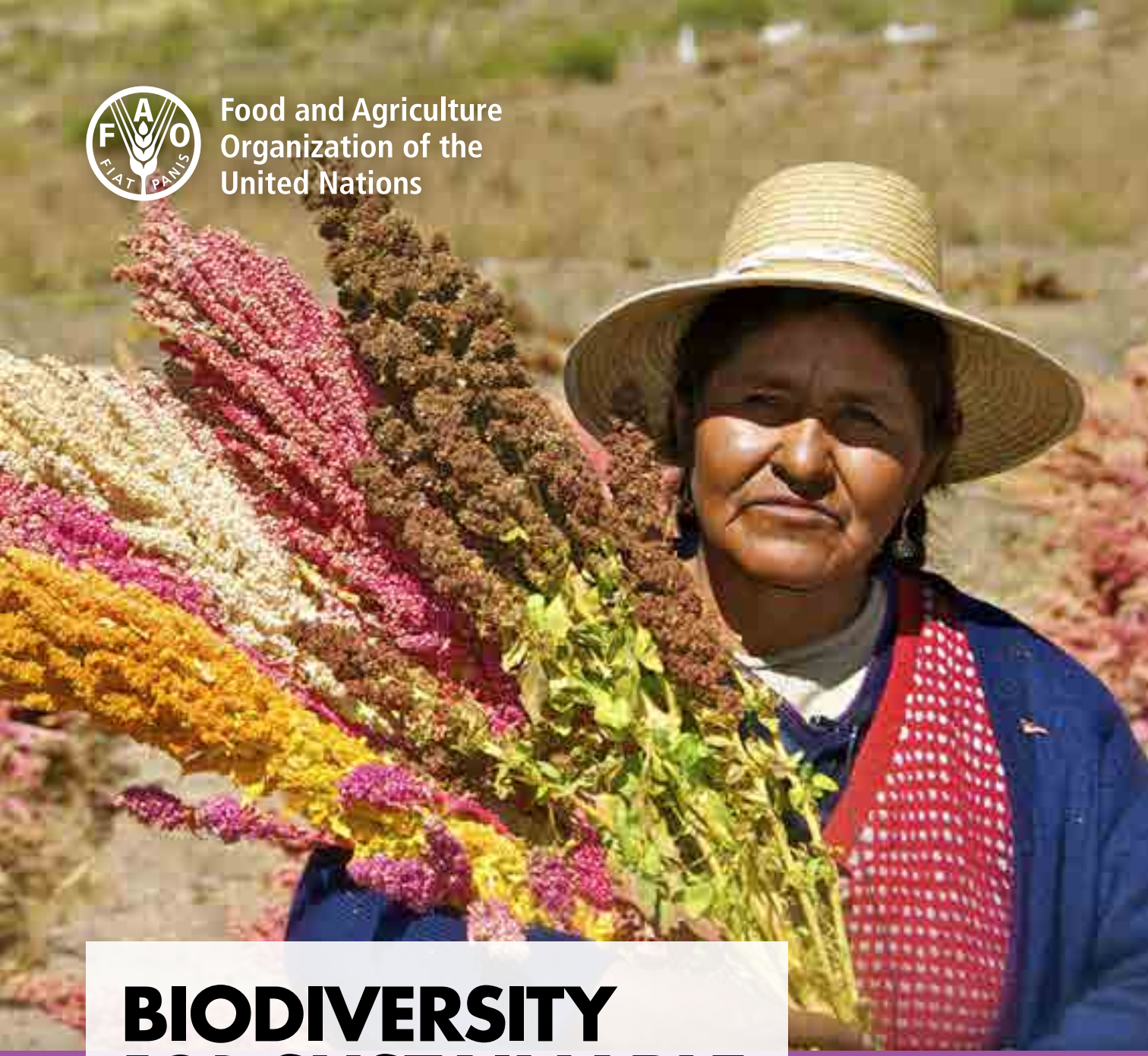


Food and Agriculture Organization of the United Nations

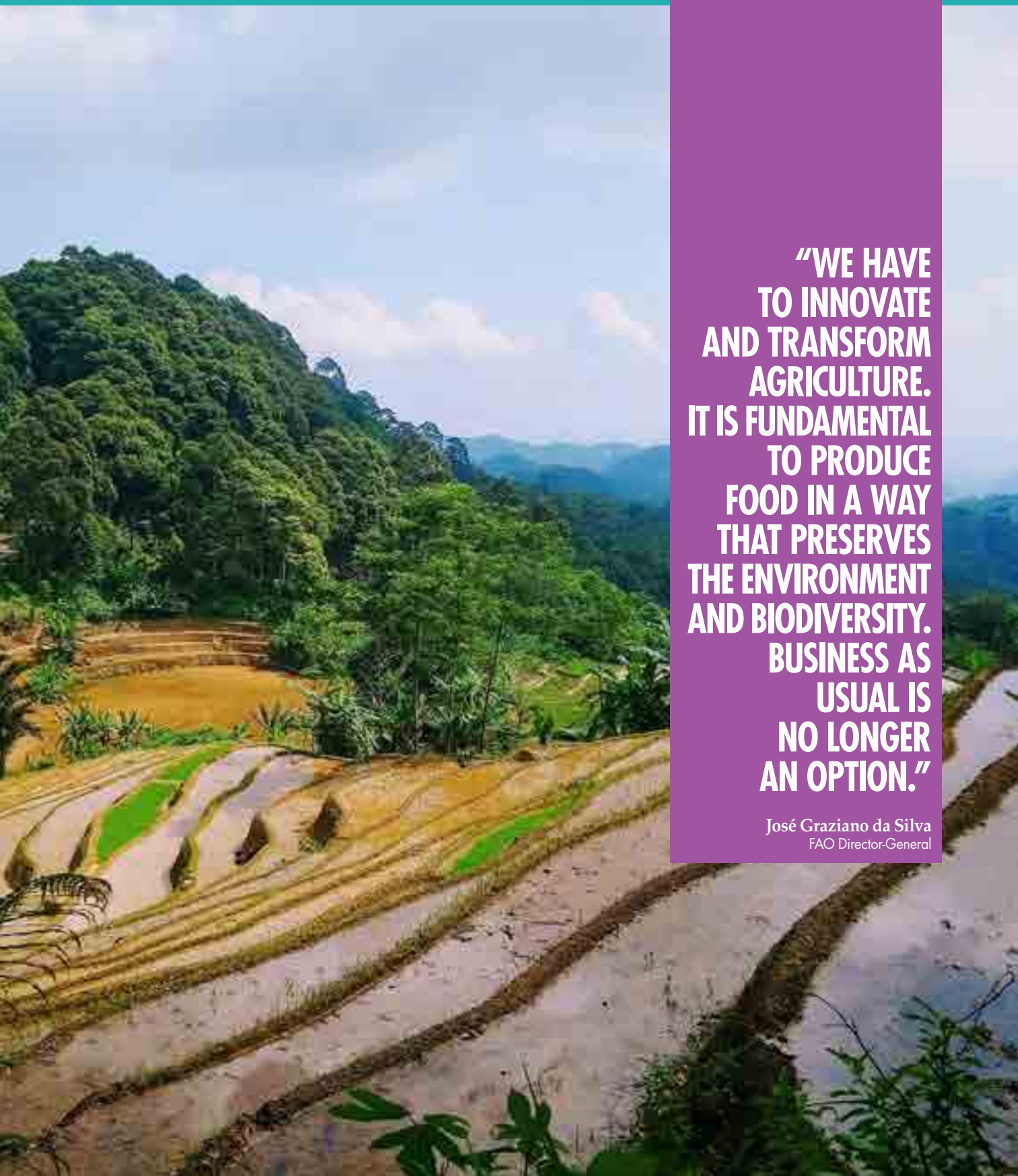
BIODIVERSITY FOR SUSTAINABLE AGRICULTURE

FAO's work on biodiversity for food and agriculture

CONTENTS

INDONESIA
Community forest landscape in Banten.
©FAO/Josil Murray

Cover photo: PERU. A lady holds quinoa flowers in the Peruvian highlands. © FAO/Claudio Guzmán



"WE HAVE TO INNOVATE AND TRANSFORM AGRICULTURE. IT IS FUNDAMENTAL TO PRODUCE FOOD IN A WAY THAT PRESERVES THE ENVIRONMENT AND BIODIVERSITY. BUSINESS AS USUAL IS NO LONGER AN OPTION."

José Graziano da Silva
FAO Director-General

INTRODUCTION

MOROCCO
Tangier – A honeybee on a sunflower.
©FAO/Abdelhak Senna

Safeguarding biodiversity on Earth is critical to overcoming major global challenges.

BIODIVERSITY IS ESSENTIAL FOR ECOSYSTEM HEALTH, SUSTAINABLE FOOD PRODUCTION AND RESILIENT LIVELIHOODS

The air we breathe, the water we drink and the food we eat all rely on biodiversity – but the demands of a growing population and the practices of unsustainable agriculture are compromising access to humanity's most basic needs.

A major factor in overcoming the global challenges we face is safeguarding and using biodiversity, the variety of life on our planet. Biodiversity is integral to ecosystem health, essential to the sustainable increase of food production and necessary to build resilient

livelihoods. However, the alarming pace of biodiversity loss today threatens devastating consequences for humankind if it goes unchecked.
While changes to the climate may be reversible in time, there is no going back once species become extinct.

The impact of a growing global population is affecting the very natural resources on which human life is based. Unsustainable crop, livestock, forestry, fisheries and aquaculture practices, as well as other unsustainable productive systems such as industries and mining, and urbanization processes, are taking an incalculable toll on the wealth of our biodiversity and the health of our ecosystems. Natural resources are becoming scarcer, climate is being affected, conflicts are increasing and people are moving away from their homelands in search of better lives.

INTRODUCTION

WEB OF LIFE

Biodiversity is the variety of plant and animal life in the world, including their genetic diversity and the variety of species and ecosystems. When there is a rich diversity of species, habitats and genetics, ecosystems are healthier, more productive and can better adapt to challenges such as climate change.

More than variety, biodiversity holds the secret of life in the way that different species, plants and animals connect, interact and depend on one another. Forests provide homes for animals. Animals eat plants. The plants need healthy soil to grow. Fungi help fertilize the soil. Bees and other insects carry pollen from one plant to another, enabling the plants to reproduce. Loss of species, whether animal or plant, weakens these connections and can alter the performance of an entire ecosystem.

Biodiversity is the sum of all terrestrial, marine and other aquatic ecosystems, species and genetic diversity. It includes the variability within and among living organisms and the ecological complexes of which they are part. Biodiversity is understood at three levels:

Ecosystem diversity refers to different habitats such as temperate or tropical forests, mountains, cold and hot deserts, oceans, wetlands, rivers and coral reefs. Each ecosystem is characterized by complex relationships between living components such as plants and animals and non-living components such as soil, air and water.

Species diversity refers to the variety of different species such as honeybees, tuna, wheat and yeast.

Genetic diversity corresponds to the variety of genes contained in plants, animals, fungi and microorganisms. It occurs within a species as well as between species; for example, Holstein Friesian, Nguni and Hereford are all cattle, but they look different and have different meat and milk performance.

SOUTH AFRICA
Global Pollination Project.
©FAO/Nadine Azzu

Farmers, pastoralists, forest dwellers and fisherfolk helped weave the rich web of life over hundreds upon hundreds of generations. But it is only now that we are beginning to understand the negative impact that unsustainable human development has had on biodiversity and the

consequences for our planet. To take just one example, in just 12 years, between 2005 and 2016, livestock breeds classified as being at risk of extinction increased by 13 percent.

Modern food systems are having a profound effect on both food production and consumption patterns. Just five crops – rice, wheat, maize, millet and sorghum – provide about half of human food-energy needs; five animal species – cattle, sheep, goats, pigs and chickens – deliver about a third of the average daily protein consumed; and ten species of fish account for more than a quarter of capture production from the oceans and seas. Using such a small number of species, often with a narrow genetic base, increases the vulnerability of production systems and puts food security and nutrition at risk.

BIODIVERSITY FOR FOOD AND AGRICULTURE

To feed the 10 billion people projected to live on planet Earth in 2050, we must strike a balance between quality and diversity, linking productivity to sustainability and addressing the needs of people.

There is growing recognition that safeguarding biodiversity and managing natural resources sustainably must be a priority in national plans if we are to deliver nutritious food for present and future generations and achieve the 2030 Agenda for Sustainable Development.

Today, some 821 million people still suffer from chronic hunger, nearly a quarter of children under the age of five are stunted, and malnutrition affects a third of the global population. The rise in obesity, now afflicting one in eight people on the planet, is a worrying new trend, driven ever higher by rapid urbanization and the relatively easy access poor people have to cheap, energy-dense, processed food high in fats, salts and sugars.

A major response to malnutrition, climate change, emerging diseases, pressures on feed and water supplies, and shifting market demands is to conserve and sustainably use a wide range of plant and animal diversity. Sustainable agriculture is the answer to reversing trends that lead to biodiversity loss, damaged ecosystems, and the deterioration and degradation of our natural resources. Techniques that successfully integrate all three dimensions of sustainability (social, economic and environmental) have the potential to better conserve natural resources while growing more and healthier food with fewer resources, responding to increasing urban demand for greater nutrition and responsible consumption. Mainstreaming biodiversity, integrating landscape and seascape approaches into actions, policies and investments, and supporting farmers' rights to genetic resources, are key to building resilient livelihoods.

Tapping into ecosystem services reduces the need for external inputs and improves efficiency.

FAO AND BIODIVERSITY

FAO strives to harmonize the need for food with that of protecting natural resources through the development of an integrated approach to sustainability across agriculture, forestry, fisheries and aquaculture. Recognizing that biodiversity is an integral part of agriculture, FAO is committed to supporting governments and working with other key actors to mainstream biodiversity as a vital element of sustainable food and agriculture.

SUDAN

A variety of dried maize cobs.
©FAO/Raphy Favre

BOOSTING ECOSYSTEM SERVICES

Agriculture benefits from healthier ecosystems and approaches that integrate ecosystem concerns into crop, livestock, forestry, fisheries and aquaculture practices. Ecosystems provide four types of services:

- **Provisioning services** are the materials from which people benefit for supply of food, feed, water, fibre, wood and fuel. They directly support livelihoods and are valued in markets. They include domesticated crops and livestock raised by farmers and livestock keepers, trees planted and harvested by forest dwellers, and aquatic species harvested or raised by fishers and aquaculture practitioners. Other services, though not consumed directly and therefore not attributed a value, are likewise equally important to food and agriculture.
- **Regulating services** are the benefits obtained from the regulation of ecosystem processes such as the regulation of air quality and soil fertility, control of floods or crop pollination.
- **Supporting services** are necessary for the production of all other ecosystem services, by providing plants and animals with living spaces, allowing for diversity of species, and maintaining genetic diversity.
- **Cultural services** are non-material benefits people gain from ecosystems, like aesthetic and engineering inspiration, cultural identity and spiritual well-being.

Appreciating the totality of these four ecosystem services is fundamental to maintaining a healthy planet.

BIODIVERSITY FOR FOOD AND AGRICULTURE

COTE D'IVOIRE

Abidjan – A woman smoking fish on an oven in the suburban area of Port-Bouet, which receives support from FAO's Coastal Fisheries Initiative. ©FAO/Sia Kambou

Since its inception, FAO has provided an intergovernmental platform in which biodiversity-related policy is discussed, and where relevant agreements are negotiated and adopted by its Members. The Organization hosts more than 70 instruments and mechanisms working on the sustainability of sectoral and cross-sectoral issues, many of them referring to biodiversity. FAO develops and supports countries in the implementation of normative and standard-setting instruments, such as international agreements, codes of conduct, international plans of action, technical standards and others that address biodiversity directly or indirectly.

RESOURCE ASSESSMENTS

FAO has long conducted assessments of food and agriculture (*The State of Food and Agriculture*), forests (*The State of the World's Forests; Global Forest Resources Assessment*), and fisheries and aquaculture (*The State of World Fisheries and Aquaculture*). These have contributed to knowledge of the state of species and ecosystems of relevance to food and agriculture. In 2015, FAO, in collaboration with the Intergovernmental Technical Panel on Soils, published the first report on the *Status of the World's Soil Resources.*

NUTRITION AND HEALTHY DIETS

Domestication and agricultural selection have targeted and improved a small share of the thousands of plant and animal species that our ancestors used to hunt, fish and gather. While this led to better performance and adaptation to specific conditions, allowing us to feed a growing population, it also resulted in a loss of diversity.

Today, only three staple crops (rice, maize and wheat) and three animal species (cattle, pigs and chickens) together provide the majority of the world's food-energy intake. Production intensification and wider use of external inputs have resulted in a reduction in the range of varieties used in crop production. Globalization and changing patterns of food production and consumption are also contributing to a crucial shift towards dietary simplification. Diets low in variety but high in energy contribute to the

escalating problems of obesity and chronic disease, which are increasingly found alongside micronutrient deficiencies.

Biodiversity plays a key role in ensuring dietary adequacy. Micronutrient needs for human health cannot be satisfied without animal, fish and plant genetic diversity, species diversity and ecosystem diversity. Pollination leads to higher nutrient content in many crops and fruits.

The alarming pace of biodiversity loss and ecosystem degradation makes a compelling case for re-examining agricultural systems and diets. Sustainable diets promote the use of diverse foods, including traditional and local foods, that make use of nutritionally rich species, varieties of plants and breeds of animals, as well as wild, neglected and underutilized species.

A SEA OF OPPORTUNITY

Many fish – especially fatty fish – are a source of long-chain omega-3 fatty acids, which contribute to visual and cognitive human development. Fish also provides essential minerals such as calcium, phosphorus, zinc, iron, selenium and iodine as well as vitamins A, D and B, thus helping to reduce the risks of both malnutrition and non-communicable diseases.

KEY MESSAGES

Safeguarding natural resources and biodiversity is critical to people's health and planetary wealth.

Biodiversity is crucial to sustainably producing enough nutritious food in the face of challenges such as climate change, emerging diseases, pressures on feed and water supplies and shifting market demands of a growing human population. Production should address not only the quantity of food or calories but also high nutrient values such as vitamins, minerals and other micronutrients. In agricultural ecosystems, safeguarding biological diversity is important both for food production and to conserve the ecological foundations necessary to sustain life and build rural livelihoods.

Agricultural sectors are major users of biodiversity but also have the potential to contribute to the protection of biodiversity.

Sustainable agriculture is key to reversing trends that lead to biodiversity loss, damaged ecosystems, deforestation and the overall deterioration of our natural resources. If terrestrial, freshwater and marine ecosystems are managed sustainably, agricultural sectors can contribute to the provisioning of ecosystem services. These include maintenance of water quality, nutrient cycling, soil formation and rehabilitation, erosion control, carbon sequestration, resilience, habitat provision for wild species, biological pest control and pollination.

Good governance, enabling frameworks, stewardship incentives and sound monitoring are key to mainstreaming biodiversity.

Passing legislation to manage and regulate access to genetic resources; creating conservation areas to reverse the degradation of natural habitats; fashioning incentives to promote ecosystem services; and monitoring the biodiversity of plants and animals to identify varieties and breeds at risk of extinction are all part of the enabling framework for mainstreaming biodiversity. FAO works with partners to integrate actions for the conservation, sustainable management and restoration of biological diversity across agricultural sectors at national, regional and international levels.

A HISTORY OF FAO'S WORK ON BIODIVERSITY

For more than half a century, FAO has led work on biodiversity, in pursuit of objectives to end hunger and malnutrition and alleviate poverty. Here is a timeline of FAO actions through the decades.

1950s

FAO adopts the **International Plant Protection Convention,** a multilateral treaty for the application of phytosanitary measures by governments to protect their plant resources from harmful pests introduced through international trade.

1983

FAO establishes the first intergovernmental body specifically dealing with biodiversity relevant to food and agriculture, today known as the **Commission on Genetic Resources for Food and Agriculture.** Counting 178 countries and the European Union as Members, the Commission coordinates global measures promoting biodiversity for food and agriculture. It has adopted several Global Plans of Action on plant (1996 and 2011), animal (2007) and forest genetic resources (2013).

1994

FAO begins strong collaboration with the newly formed **Convention on Biological Diversity (CBD)**.

1995

FAO adopts the **Code of Conduct for Responsible Fisheries.** The Code is based on due respect for ecosystems and biodiversity as part of effectively balancing conservation, management and development of living aquatic resources.

2001

FAO approves **the International Treaty on Plant Genetic Resources for Food and Agriculture.** The Treaty helps countries develop sustainable agriculture approaches and supports farmers and researchers adapt crops to the effects of climate change with the aim of achieving food security for all. As of October 2018, there are 144 Contracting Parties to the Treaty.

2013

FAO–WHO adopt the **International Code of Conduct on Pesticide Management.** The Code provides standards of conduct on sound pesticide management for all stakeholders involved in the pesticide life cycle from formulation to disposal.

2016

FAO launches the **Biodiversity Mainstreaming Platform** at the Thirteenth Session of the Conference of the Parties to the CBD in Cancun, Mexico, to facilitate the integration of actions for the conservation, sustainable use, management and restoration of biological diversity across agricultural sectors at national, regional and international levels.

2018

FAO hosts a **multi-stakeholder dialogue on biodiversity mainstreaming across sectors of agriculture** in collaboration with the Secretariat of the CBD, bringing together experts with the aim of building a community of practice, planning the Biodiversity Mainstreaming Platform's future work, spreading awareness and mobilizing resources.

FACTS AND FIGURES

LAND AND WATER

- **Soils host a quarter of our planet's biodiversity,** and yet 20–30 percent of lands are degraded.

- **Over 1 000 species of invertebrates** can be found in one square metre of forest soil.

- The estimated global rate of **erosion in croplands corresponds to 193 kilograms of soil organic carbon per ha per year**.

- Roughly **64–71 percent of wetlands have been lost** since the beginning of the twentieth century.

- **Agriculture uses 70 percent of all freshwater** withdrawals globally, and up to 95 percent in several developing countries.

- Almost **40 percent of the global irrigated area is reliant on groundwater.**

FISHERIES AND AQUACULTURE

- **Almost 600 aquatic species used for global food production come from aquaculture.** Ten species alone (shellfish, crustaceans, plants and fin fish) account for half of the total aquaculture production.

- **Fish provide 20 percent of animal protein** to about 3 billion people.

- Coral reefs provide vital habitat for **25 percent of the world's known marine species**.

- In 2013, **68.5 percent of assessed commercial fish stocks were fished within biologically sustainable levels,** down from 90 percent in 1974.

- Overfishing is considered the largest pressure on marine fisheries. An estimated **31.5 percent of fish stocks are classified as overfished**.

- Only ten species provide **about 30 percent of marine capture fisheries.**

FORESTS

- There are **more than 60 000 tree species in the world.** Globally, around 2 400 species of trees, shrubs, palms and bamboo are actively managed for products or services.

- **Large-scale commercial agriculture causes 40 percent of forest conversion** in the tropics and subtropics, 33 percent is caused by local subsistence agriculture and 27 percent by infrastructure development and mining, among other activities.

- As of 2015, **natural forests accounts for 93 percent of total forest area.**

- Globally, natural forest area is decreasing and planted forest area is increasing. However, **the global annual net loss of natural forests decreased from some 10.6 million hectares in the 1990s to 6.5 million hectares between 2010 and 2015.**

- Mountain areas host approximately **25 percent of terrestrial biodiversity**.

LIVESTOCK

- Livestock diversity includes a pool of **38 species of domesticated birds** and mammals with more than 8 800 breeds currently used for food and agriculture.

- There are **more than 1 000 breeds of cattle** in the world, each with different valuable traits.

- As of October 2018, **from 8 800 known livestock breeds, 8 percent are extinct,** 26 percent of breeds are at risk and 66 percent are classified as being of unknown risk status because of lack of data.

- About **150 livestock breeds have become extinct** between 2000 and 2018.

- Three species (cattle, pigs, chickens) together with three staple crops (rice, maize and wheat) **provide the majority of total calories in human diets**.

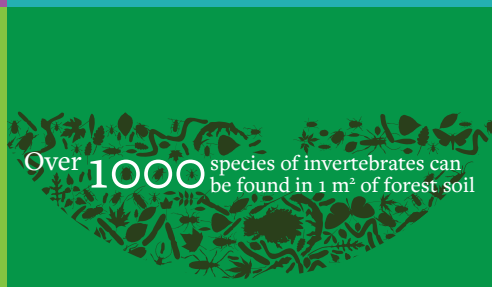
CROPS

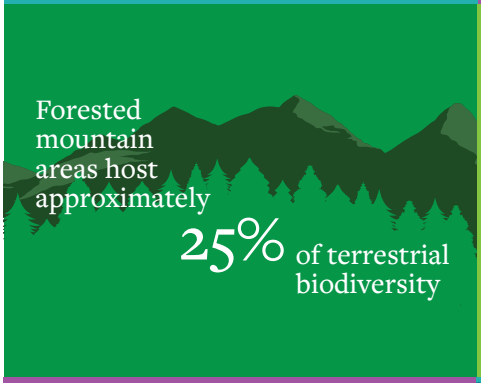
- Globally, there are almost **400 000 plant species, of which just over 6 000 plant species have been cultivated for producing food.** Of these, fewer than 200 plants were the sources of global food production in 2014, with only nine – sugar cane, maize, rice, wheat, potatoes, soybeans, oil palm fruit, sugar beet and cassava – accounting for over 66 percent of all crop production.

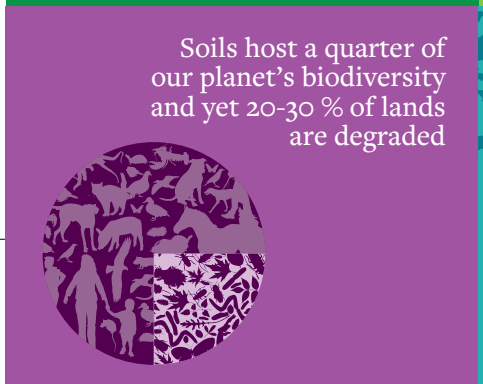
- **Three out of four crops around the globe** producing fruits or seeds for human use as food **depend, at least in part, on pollinators.**

- **Pollinators affect 35 percent of the world's total crop production** by volume, supporting the production of 87 of the leading food crops worldwide.

- The volume of agricultural production dependent on pollinators has **increased by 300 percent in the past 50 years**.







BUILDING A WORLD OF BIODIVERSITY

Supporting countries and working with partners, these stories provide a snapshot of how FAO contributes to mainstreaming biodiversity in agriculture, fisheries and forestry through projects and programmes across the globe.

BRAZIL

Forest data at the service of biodiversity

Brazil's forests are one of the most biologically diverse ecosystems in the world. In 2011, FAO began helping the Brazilian Forest Service establish a national forest monitoring and assessment system. The Global Environment Facility-funded project supports the government, the private sector and other non-governmental actors in making informed decisions by providing timely and relevant information and policy analysis regarding the state and dynamics of Brazil's forest resources.

Facts and figures

- Almost 60 percent of Brazil's territory is covered by forest, accounting for a significant proportion of global terrestrial biodiversity.
- There are 5 678 priority areas for biodiversity conservation in Brazil.
- The project works with public and private sectors to collect botanical samples: 91 021 botanical samples of trees have been collected and 5 158 tree species have been identified.
- In Brazil, the indigenous population is around 897 000, covering 305 ethnic communities who speak 274 languages. Indigenous ethnic groups and local communities possess crucial traditional knowledge of the forests' biodiversity.

Impact

By providing different analyses of collected data, including a baseline and periodically monitored forest resource indicators, the project enhances Brazil's capacity to identify and reduce environmental threats by adjusting policies, strategies and interventions, and to highlight their effectiveness. Private sector and other non-governmental decision-makers are also able to make more informed decisions that, with appropriate policy incentives, can further protect biodiversity and conserve and enhance carbon stocks.

REHABILITATING MANGROVE FORESTS BENEFITS BOTH LIVELIHOOD GENERATION AND ECOSYSTEM SERVICES

BRAZIL
Women workers weed and clean around cacao trees in a plantation.
©FAO/K. Boldt

KENYA

Diversity through agroecology

Responding to declining areas of mangroves in Kenya, FAO, as part of the Blue Growth Initiative, has implemented a multifaceted project with strong agroecological elements, including watershed management techniques, to support improved ecosystem services at the same time as food, nutrition and livelihood security. By raising awareness of the importance of agrobiodiversity and environmental protection, the community sustainably managed its mangrove forests and made income-generating activities more environmentally responsible.

Facts and figures

- An estimated 268 122 seedlings were planted on 41 hectares of degraded mangrove forest areas.
- Three new mangrove nurseries were established in combination with aquaculture and beekeeping activities.

Impact

Rehabilitating mangrove forests benefits both livelihood generation and ecosystem services. One significant result of the FAO–Kenya project was increased biodiversity of fish fingerlings and other aquatic animals within the restored areas. A crab hatchery was supported through a public–private partnership, and crab aquaculture activities were implemented in an environmentally responsible way. Crabs were marketed in local tourist hotels and abroad, with young entrepreneurs starting eco-aquaculture farms in collaboration with local restaurants. Strengthening cross-sectoral links through agroecology provides a roadmap for an agroecological transition.

BUILDING A WORLD OF BIODIVERSITY

LAO PEOPLE'S DEMOCRATIC REPUBLIC

Growing a rice–fish culture

Lao People's Democratic Republic enjoys a rich aquatic biodiversity, with rice fields home to an impressive diversity of aquatic organisms. Fish, frogs, eels, snails, crabs and aquatic insects are key to the nutritional and food security needs of the country's population.

Working with extension officers and pilot communities on integrated aquaculture–agriculture techniques, FAO helped local farmers construct small, plastic-lined earth ponds that can be used to intensify their rice–fish culture system. The ponds are small enough to be dug by hand, allowing farmers to nurse seed fish that can be used as a source of food during dry seasons when food is often scarce.

Facts and figures

- In 2016, 28 families produced a total of 68 000 seed fish. These numbers increased in 2017, with 30 families producing a total of 102 000 seed fish.
- Most farmers produced fish seed (young tilapia), primarily used for stocking rice fields and small ponds, though some were sold to other farmers.

Impact

While the limited availability of seed fish constrains the development of aquaculture and rice–fish culture in Lao People's Democratic Republic, the project shows that partnering with farming communities and national agricultural extension services can deliver innovative interventions that are well within farmers' technical and financial capabilities to enhance food and nutrition security and enrich biodiversity.

INDONESIA

Capture-based aquaculture: Napoleon in the Pacific?

When local fisherfolk in Indonesia's Anambas and Natuna islands began to witness the decline of Napoleon fish in their reefs, they knew that something had to change in their fishing methods. The result is a practice called capture-based aquaculture, in which local fisherfolk capture a portion of young Napoleon fish to farm and manage. Although distinct from the colourful reef fish they grow into as adults, island fishers have become adept at spotting juvenile Napoleon fish.

The experiment of catching fish of tiny size could serve as a useful model for well-managed capture-based aquaculture, and is set to be of major interest to Indonesia's Government, along with conservation organizations, academics and international organizations.

Facts and figures

- The Convention on International Trade in Endangered Species (CITES) lists the Napoleon fish among its protected species.
- This listing level still allows for exports, but only within a carefully managed fisheries programme.
- Capture-based aquaculture is based on:
  - collection of juvenile fish over

LAO PEOPLE'S DEMOCRATIC REPUBLIC

A farmer throws a net to catch fish on a rice–fish–poultry farm.
©FAO/K. Pratt

a short harvest period;
- transfer of the juveniles to culture nets, maintaining a high survival rate for otherwise vulnerable life stages; and
- feeding the fish and waiting for them to "grow out" to market size.

Impact

Tiny juvenile Napoleon fish in the wild are likely to have extremely high mortality rates, so this type of managed capture-based aquaculture approach, if paired with proper conservation efforts and controlled fishing activities, could allow for improved livelihoods for fishing communities while simultaneously leaving sufficient fish in the wild and safeguarding the species' habitat.

Although still in the early stages, this Indonesian example is proving a promising attempt at merging livelihood requirements of fishing communities with conservation efforts that will allow Napoleon fish to return in greater numbers to Indonesia's reefs.

CHILE

Celebrating heritage on Chiloé Island

Part of an integrated and self-sufficient system, agriculture in Chiloé relies on the ocean, livestock and forests to support production that is largely based on a rich and endemic agrobiodiversity.

Over centuries, Chiloé farmers have domesticated and maintained scores of native plants, as well as bred cattle and sheep, which supply manure in synergy with the cropping system. The forest provides wood materials and edible plants for medicinal and aromatic uses such as insect control and pollination promotion.

With respect to the social and cultural aspects of the system, instances such as mingas, seed exchanges, agricultural work, celebrations and, in general, spontaneous meeting spaces, have been essential spaces where the values related to Globally Important Agricultural Heritage Systems (GIAHS) are shared promoting the conservation of biodiversity and the valuation of bicultural assets.

BUILDING A WORLD OF BIODIVERSITY

FAO'S ACTION AGAINST DESERTIFICATION HELPS COMMUNITIES IN DEGRADED DRYLANDS IN BURKINA FASO BECOME SELF-SUPPORTING

Facts and figures

- The unique system on Chiloé has led to the establishment of a germplasm bank to conserve native potato varieties (256 cultivars are kept at present).
- It has provided farmers with technical support by sharing agroecological practices to improve yields without harming the environment.
- It has led to the creation the first GIAHS farmers' cooperative on the island.
- It has resulted in the launch of a communications campaign promoting agro-tourism and gourmet market tourism.

Impact

Since its Globally Important International Heritage System (GIAHS) designation in 2014, Chiloé Island has undergone significant change. Chiloé Islanders, proud of their history and uniqueness, have developed a real interest in biodiversity conservation, contributing to a growing demand for local garlic and native potatoes as well as sheep meat.

With FAO technical support for cooperatives, farmers have deepened their knowledge and managed to create 21 new productive varieties resistant to drought conditions

BURKINA FASO

Large-scale restoration for small-scale farming in Burkina Faso's Sahel region

FAO's Action Against Desertification Programme supports the restoration of degraded drylands in Burkina Faso. Providing scientific plant expertise while focusing on the communities' needs for useful species and preferences for restoration, the programme champions an approach that places communities at its centre. To bring its restoration work to scale, the programme has introduced mechanized land preparation, through the Delfino plough, which is a vital tool to support efforts towards a land degradation neutral world.

Facts and figures

- In Africa's Great Green Wall area, over 10 million hectares must be restored each year until 2030 to meet Sustainable Development Goal 15 on land degradation.
- One-third of Burkina Faso's territory is degraded – over 9 million hectares of productive land – an area that is estimated to expand at an average of 360 000 hectares per year.
- Over 4 700 agro-pastoralist farmers, half of them women, have benefitted from the programme since its launch in 2014.

BURKINA FASO
Farmers in a field with excavated mid-moon dams ready to save water in the coming rainy season.
©FAO/Giulio Napolitano

- By the end of 2018, the programme aims to have planted and restored 35 000 hectares of degraded land.
- Nearly 250 000 inoculated seedlings have been planted and over 13 tonnes of forest seeds of woody and herbaceous species have been sown directly.

Impact
Capacity development is at the heart of efforts led by Action Against Desertification to help communities become self-supporting. In Burkina Faso, 8 000 people from 45 rural communities have increased their knowledge of restoration and sustainable land management. They are organized through 'Village Management Committees' to look after the planted sites, bringing greater sustainability to restoration activities. The programme has also contributed to local communities developing value chains of non-timber forest products to support economic growth.

WEST AFRICA

Transboundary conservation of cocoa agroforestry in Ghana and Côte d'Ivoire

The traditional cocoa agroforestry system in Eastern Côte d'Ivoire and Western Ghana is characterized by a deliberate effort by cocoa farmers to cut down economically valuable trees on their farms to prevent forest-logging companies from destroying their cocoa farms in the process of removing them. The practice has proven

BUILDING A WORLD OF BIODIVERSITY

detrimental to the productivity of cocoa farms, which suffer in the absence of the much-needed shade provided by bigger trees on the farm.

An FAO project financed by the Global Environment Facility has improved production landscapes around the forest reserves and protected areas of the project sites. The project has involved intensive training of farmers on the benefits of keeping trees on their farms, and adopting cocoa agroforestry best practices. Beekeeping and snail-rearing have been promoted as alternative livelihoods for farmers, key to the project's success in mainstreaming biodiversity into agricultural development processes and agricultural sector policies.

Facts and figures

- Some 31 300 tree seedlings were planted on 816 ha of cocoa farm in Ghana, while 13 600 native tree seedlings were planted on 427 ha of cocoa farm in Côte d'Ivoire.
- Some 22 026 ha of production landscapes are now under improved management in Ghana and Côte d'Ivoire, where tree cover has increased to 30 percent.
- Cocoa farm productivity has increased from 474 kg/ha to 525 kg/ha in Ghana, while in Côte d'Ivoire, it increased from 250 kg/ha (baseline) to 300 kg/ha.
- Honey production has been taken up by young people in rural areas of Ghana and Côte d'Ivoire.

Impact

Improving the cocoa agroforestry system, creating opportunities for alternative livelihoods for local people, developing their capacities to resolve human–wildlife conflicts and improving the productivity of their cocoa farms proved effective in increasing forest cover and conserving natural resources in the Bia (Western Ghana) and Biambarakro (Eastern Côte d'Ivoire) transboundary conservation area. Cocoa farmers and local communities received the appropriate incentive to participate voluntarily in the biodiversity conservation of the area.

The Governments of Ghana and Côte d'Ivoire are now set to sign a Memorandum of Understanding to mainstream these biodiversity conservation instruments into their agricultural and agroforestry production systems and policies for the sustainable management, utilization and conservation of their forest resources.

TANZANIA
A herd of Ankole Longhorn cows grazing on an unmanaged parcel of land in the catchment of Rusumo.
©FAO/Marco Longari

GLOBAL

Monitoring livestock diversity around the world

Many livestock breeds possess unique characteristics that contribute to building people's resilience and meeting various challenges such as those related to climate change. Yet, indiscriminate cross-breeding and use of exotic breeds, together with unprofitable local breeds and weak policies are combining to place the world's remaining livestock diversity at risk.

Supporting countries in making informed decisions and in taking action to protect livestock breeds from extinction, the Domestic Animal Diversity Information System (DAD-IS) (www.fao.org/dad-is) offers a database of breed-related information and photos for animal genetic resources around the world. It allows users to analyse the status of diversity of livestock breeds on national, regional and global levels, including breeds' risk of extinction.

Facts and figures

- In 2018, a total of 8 803 breeds have been reported from 182 countries covering 38 species.
- This includes 7 745 local breeds (i.e. reported in only one country), 511 regional transboundary breeds (reported in more than one country of one region) and 547 international transboundary breeds (reported in more than one region).

Impact

Maintained and developed by FAO, with regular updates from national coordinators nominated by countries, DAD-IS provides countries with the means to meet international obligations for reporting on the status of animal genetic resources. Countries are obliged to report on the status of the genetic diversity of domesticated animals within the framework of the Convention of Biological Diversity (CBD) as well as under the 2030 Agenda for Sustainable Development.

GLOBAL

Pollination in every nation

Pollination has come under the spotlight after a series of crop pollination failures, the rapid decline in managed honeybee populations and the growing number of crops being grown under intensive systems.
The *Conservation and Management of Pollinators for Sustainable Agriculture, through an Ecosystem Approach* – also known as the Global Pollination Project (GPP) – targeted these challenges by harnessing the benefits of

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THE GLOBAL SOIL PARTNERSHIP PROMOTES THE SUSTAINABLE MANAGEMENT OF SOILS, A KEY RESERVOIR OF GLOBAL BIODVERSITY

pollination services provided by wild biodiversity for human livelihoods and sustainable agriculture through an ecosystem approach in selected countries.

Facts and figures

- Species extinction rates of bees and other pollinators are 100 to 1 000 times higher than normal due to human impact.
- The GPP, which closed in 2015, focused on smallholder farms and large plantations: crops critical for food security and commodities important primarily in export markets.

Impact

Tested, evaluated and showcased in farming systems in seven countries with a wide diversity of ecological zones and farming patterns, the GPP showed how the services of pollination can be conserved and used sustainably in agriculture through the application of the ecosystem approach. Capacity was increased and awareness raised to promote wise management of pollinators and their services through best practices and knowledge extension.

At the global level, the project collaborated with respected institutions and experts to develop tools and guidance material on a range of pollinator and pollination-related issues. As a result of project efforts, a set of tools, methodologies, strategies and best management practices has been produced that can be applied to pollinator conservation efforts worldwide.
www.fao.org/pollination/projects

GLOBAL

Protecting biodiversity through sustainable soil management

The Global Soil Partnership (GSP) was established in December 2012 to enhance collaboration and synergy of efforts for sustainable soil management. According to FAO's *Status of the World's Soil Resources* report (2015), soil organic carbon and soil biodiversity are crucial to increasing food availability and the soil's ability to buffer against climate change effects. The GSP strives to raise awareness of the role of sustainable soil management in safeguarding biodiversity, highlighting that soils are a key reservoir of global biodiversity. It is sustained by the FAO Soil Charter (1981) and the endorsement of World Soil Day on 5 December every year, by the General Assembly of the United Nations, and the proposed Voluntary Guidelines for Sustainable Soil Management.

BANGLADESH

A man checks the quality of red wiggler worms at the Mahilata Organic Fertilizer Production Farm. ©FAO/Mohammad Rakibul Hasan

Facts and figures

- FAO manages the Secretariat of the Global Soil Partnership, with 194 countries actively participating in all meetings.
- The Global Soil Information System, established by the GSP, monitors and forecasts the condition of the Earth's soil resources.
- The first-ever Global Soil Carbon Map identifies degraded areas, sets restoration targets and explores sequestration potential as a way to mitigate and adapt to climate change.
- The Global Soil Laboratory Network has been established, with 187 soil laboratories in more than 100 countries.
- Since 2012, the GSP has delivered capacity development in over 100 countries.
- Nine regional soil partnerships are well established and have consolidated implementation plans. They work in close collaboration with FAO regional and national offices in establishing an interactive consultative process with national soil entities.

Impact and sustainability

The GSP supports soil biodiversity enhancement through a range of measures such as monitoring soil biodiversity, maintaining or enhancing soil organic matter levels, regulating authorization and use of pesticides in agricultural systems, using nitrogen fixing leguminous species, and restoring plant biodiversity and crop rotation. These activities lead to sustainable soil management and higher and more stable productivity. They also contribute to the preservation of wild biodiversity by reducing threats to remaining natural ecosystems, on farms and on the agricultural frontier.

GLOBAL

Accessing plant genetic material for food and agriculture

Biodiversity in farmers' fields ensures a balanced food basket and serves as an 'insurance policy' against crop failures. Diversifying and conserving our crops will help achieve food and nutrition security and Zero Hunger. With this in mind, countries that are part of the International Treaty on Plant Genetic Resources for Food and Agriculture (PGRFA) agree to make their plant genetic diversity available through the Treaty's Multilateral System of access and benefit-sharing, covering 64 crops, which account for 80 percent of food from plants. The International Treaty also offers other important mechanisms such as the Global Information System, connecting ▶

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vital information about plant genetic resources for food and agriculture; underpinning sustainable use of plant genetic resources for food and agriculture; promoting the protection of farmers' rights; and supporting projects in developing countries through the Benefit-sharing Fund.

Facts and figures

- Largest global genepool of plant genetic material, currently comprising over 2.3 million samples and their vital information.
- There are 61 projects under the Benefit-sharing Fund in 55 developing countries over 3 project cycles, to date, positively impacting 1 million people and leading to:
  - increased availability of varieties resistant to climate shocks, pests and disease;
  - increased crop yields and quality; and
  - increased market access and profitability.
- To date, the Global Information System has over 725 000 records on plant genetic resources for food and agriculture.

Impact

The International Treaty is the key policy instrument dealing with the triple challenge of conserving crop diversity, climate change adaptation, and achieving food and nutrition security.

The treaty is the only legally binding instrument recognizing the enormous contribution of **local and indigenous communities and farmers** for PGRFA conservation and development.

GLOBAL

Measuring the positive and negative effects of livestock on wild biodiversity

Around 30 percent of ice-free land on Earth is used for livestock production – a number large enough to result in modifications to biodiversity habitats. These modifications are not restricted to negative impacts such as the conversion of forests to pastures or feed crops. They can also benefit biodiversity, when extensive livestock production maintains grassland habitats hosting a unique pool of wild species (insects or birds for example), allows coexistence with other large mammals (as in East Africa) and provides key ecosystem services. Shifting from negative to positive impacts often depends on production system, context and practices. Having the right tools to measure the impacts of livestock on biodiversity is thus key to maximizing biodiversity benefits and mitigating losses.

Facts and figures

- The Livestock Environmental Assessment and Performance (LEAP) partnership gathers all stakeholders from the livestock sector (private sector, NGOs/CSOs, 17 countries).
- The goal of LEAP is to agree on how to measure and improve the environmental performance of the livestock sector.
- A group of international experts tackled the emerging challenge of biodiversity assessment and produced a reference document entitled *Principles for the assessment of livestock impacts on biodiversity.*
- A toolbox on biodiversity indicators and assessment methods is currently being produced.
- More than 20 case studies are available to illustrate practical examples of biodiversity assessments applied to livestock at various scales, in different countries and with different production systems.

Impact and sustainability

The *Principles for the assessment of livestock impacts on biodiversity* document has been used at sector level by the International Dairy Federation to develop its own guide on biodiversity for the dairy sector. The document has already been applied and tested in different countries,

CHINA
The Zhejiang Huzhou mulberry-dyke and fish-pond system protects a huge biodiversity as well as a complex landscape.
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such as in Uruguay by the meat sector, in Argentina by pastoralist associations, and in Ireland at research level. LEAP is working towards more comprehensive environmental assessments to adopt practices that offer co-benefits for biodiversity conservation, climate change mitigation, water footprint reduction, nutrient use efficiency and more.

GLOBAL

Inland fisheries' linkage to aquatic biodiversity

Inland aquatic ecosystems represent the most biodiverse sources of food consumed by humans. Yet, pollution, habitat loss and degradation, draining wetlands, river fragmentation, invasive species and poor land management are threatening their biodiversity and health.

Facts and Figures

- Freshwater ecosystems cover only about 1 percent of the Earth's surface but provide habitat for over 40 percent (13 000) of the world's total number of fish species.
- Another 2 000 species of fish can also live in brackish water. In general, the level of knowledge on freshwater biodiversity – i.e. species richness, endemism, production, level of endangerment and value – is poor or out of date for many areas.
- Rice fields are an important source of biodiversity and include over 230 species of fish, insects, crustaceans, molluscs, reptiles, amphibians and plants (in addition to rice) that are used by local communities.
- The exploited aquatic biodiversity of inland fisheries provides approximately 12 percent of the world's capture fish, and most of this is in countries or areas that have little or no access to marine fishery resources or aquaculture production.

Impact and Sustainability

Aquatic biodiversity is an important source of nutrition in many developing countries, but it is threatened by environmental changes arising from irrigation and hydropower development as well as agricultural and urban developments. Non-native aquatic biodiversity can contribute significantly to the production and value in inland fisheries and aquaculture but can also threaten native biodiversity. Competition for freshwater greatly impacts inland and coastal fisheries. However, with improved management of dams, reservoirs and irrigation systems, ecosystem services can be maintained, thereby conserving biodiversity and producing food.

Together with global best practice documents for precautionary approaches for the introduction of new species and for the responsible movement of live aquatic animals, FAO has also developed technical guidelines for responsible inland fisheries, rehabilitation of inland fisheries, and responsible recreational fisheries. ■

A PLATFORM FOR ACTION

The Biodiversity Mainstreaming Platform aims to turn rich and varied knowledge into actionable recommendations.

The Fortieth Session of the FAO Conference welcomed FAO's initiative to lead the **Biodiversity Mainstreaming Platform** and requested FAO, in collaboration with the CBD, other UN organizations and partners, to facilitate the integration of actions for the conservation, sustainable use, management and restoration of biological diversity across agricultural sectors at national, regional and international levels.

The ultimate goal of the Platform is the adoption of good practices across all agricultural sectors that will support biodiversity conservation, thus increasing the productivity, stability and resilience of production systems, and reducing pressure on natural habitats and species. Addressing SDGs 2, 14 and 15 in particular, the Platform will also facilitate the exchange of expertise to improve the design and coordination of policies from local to international levels, as well as the exchange of information and data among stakeholders to reach a common understanding of the status quo, trends and trade-offs in the conservation and use of biodiversity services.

Through FAO, the Platform will also serve as a mechanism to assist in translating the richness and variety of knowledge forms into policy-related actionable recommendations. The first major event organized by the Platform, the Multi-stakeholder Dialogue on Biodiversity Mainstreaming across the Agricultural Sectors, took place in Rome on 29–31 May 2018, enabling cross-sectoral linkages between the Committees.

WAY FORWARD

Following consideration of the Dialogue's outcomes, the Technical Committees on Agriculture, Fisheries, Forestry and Commodity Problems requested FAO to develop a strategy on biodiversity mainstreaming across agricultural sectors, ensuring consistency with other FAO strategies, including that of climate change, and in line with the preparation of the post-2020 biodiversity framework of the CBD.

The strategy will demonstrate FAO's commitment to playing a catalytic role in building the momentum to achieve a "Paris moment" at the Fifteenth Session of the Conference of the Parties to the CBD.

The Biodiversity Mainstreaming Platform is focusing on the following areas of work:

1. **FAO process**
   - Strengthening FAO's institutional capacity to mainstream biodiversity
   - Developing a biodiversity strategy for FAO for consideration by the Conference at its next session
   - Ensuring FAO governing and statutory bodies' engagement in and support for biodiversity mainstreaming
   - Supporting countries in mainstreaming biodiversity to achieve the SDGs
2. **Multi-stakeholder engagement**
   - Engaging in relevant international processes, including the development of the CBD's post-2020 global biodiversity framework
   - Organizing national/regional multi-stakeholder dialogues on biodiversity mainstreaming
3. **Fundraising**
   - Developing a funding strategy and proposals.

ITALY

29 May 2018, Rome – Multi-stakeholder Dialogue on Biodiversity Mainstreaming across Agricultural Sectors, Biodiversity Mainstreaming Platform, FAO headquarters (Atrium).
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TWIN TRACKS

Fully operationalizing the Biodiversity Mainstreaming Platform will require working on two parallel and inter-connected tracks.

Global Level

- Raising awareness of the importance of biodiversity across agricultural sectors
- Promoting dialogue on key issues such as policies, metrics, practices and territorial planning
- Facilitating the engagement of stakeholders from the agricultural sectors in the development of the CBD's post-2020 global biodiversity framework

Regional and National Levels

- Regional and national multi-stakeholder dialogues promoting sustainable practices in agriculture, forestry and fisheries
- Supporting the integration of biodiversity in national agricultural plans, as well as sustainable agriculture in countries' commitments to multilateral environmental agreements
- Implementing global policy instruments for mainstreaming biodiversity ■

THE BIODIVERSITY MAINSTREAMING PLATFORM HELPS SPREAD GOOD PRACTICES TO SUPPORT BIODIVERSITY CONSERVATION IN AGRICULTURE

MAIN PUBLICATIONS

THE 'STATE OF THE WORLD' SERIES

Under the guidance of the Commission on Genetic Resources for Food and Agriculture, FAO has conducted assessments of the state of the world's genetic resources in the crop (*The Second Report on the State of the World's Plant Genetic Resources for Food and Agriculture*), livestock (*The Second Report on the State of the World's Animal Genetic Resources for Food and Agriculture*), and forest sectors (*The State of the World's Forest Genetic Resources*). FAO is currently finalizing the first reports on *The State of the World's Aquatic Genetic Resources for Food and Agriculture* and on *The State of the World's Biodiversity for Food and Agriculture.*

FAO. forthcoming. *The State of the World's Biodiversity for Food and Agriculture.* Rome.

FAO. forthcoming. *The State of the World's Aquatic Genetic Resources for Food and Agriculture.* Rome.

FAO. 2018. *Multi-stakeholder Dialogue on Biodiversity Mainstreaming across Agricultural Sectors.* 29–31 May 2018. **FAO,** Rome. www.fao.org/about/meetings/multi-stakeholder-dialogue-on-biodiversity

FAO. *2018 State of the World's Forests 2018. Forest pathways to sustainable development.* Rome. www.fao.org/3/I9535EN/i9535en.pdf

FAO. 2018. *The State of World Fisheries and Aquaculture 2018. Meeting the Sustainable Development Goals.* Rome. www.fao.org/3/i9540en/I9540EN.pdf

FAO. 2016. Incentives for Ecosystem Services. Latin America Regional Policy Dialogue. In: FAO [online]. www.fao.org/in-action/incentives-for-ecosystem-services/policy/policy-recommendations/latin-america-regional-policy-dialogue-2015

FAO. 2016. Incentives for Ecosystem Services. East Africa Regional Policy Dialogue. In: FAO [online]. www.fao.org/in-action/incentives-for-ecosystem-services/policy/policy-recommendations/east-africa-regional-policy-dialogue-2016

FAO. 2016. Voluntary Guidelines for Sustainable Soil Management. Rome. www.fao.org/3/a-bl813e.pdf

FAO. 2016. *Global Forest Resources Assessments.* Rome. www.fao.org/forest-resources-assessment

FAO. 2016. *Global Forest Resources Assessment 2015. How are the world's forests changing?* Second edition. Rome. www.fao.org/3/a-i4793e.pdf

FAO. 2016. *Dryland forestry.* In: FAO [online]. www.fao.org/dryland-forestry

FAO. 2016. *Pollination services to agriculture: sustaining and enhancing a key ecosystem service.* Rome. www.routledge.com/Pollination-Services-to-Agriculture-Sustaining-and-enhancing-a-key-ecosystem/Gemmill-Herren/p/book/9781138904408

FAO. 2016. *Global drylands assessment.* Rome. www.fao.org/dryland-forestry/monitoring-and-assessment/global-drylands-assessment.

FAO/CBD. 2016. *Mainstreaming ecosystem services and biodiversity into agricultural production and management in East Africa.* Rome. www.fao.org/3/a-i5603e.pdf

FAO. 2015. *Incentives for Ecosystem Services in Agriculture (IES).* Rome. www.fao.org/3/a-i4702e.pdf

FAO. 2015. *Guidelines for Developing a National Strategy for Plant Genetic Resources for Food and Agriculture.* Rome. www.fao.org/3/a-i4917e.pdf

FAO. 2015. *Global guidelines for the restoration of degraded forests and landscapes in drylands: building resilience and benefiting livelihoods.* Forestry Paper No. 175. Rome. www.fao.org/3/a-i5036e.pdf

FAO. 2015. *Principles for the assessment of livestock impacts on biodiversity.*

Rome.
www.fao.org/3/a-av154e.pdf

FAO. 2015. *The Second Report on the State of the World's Animal Genetic Resources for Food and Agriculture,* edited by B.D. Scherf & D. Pilling. FAO Commission on Genetic Resources for Food and Agriculture Assessments. Rome. www.fao.org/3/a-i4787e.pdf).

FAO. 2015. *Voluntary Guide for National Seed Policy Formulation.* Rome.
www.fao.org/3/a-i4916e.pdf

FAO, 2015. *Wheat landraces in farmers' fields in Turkey: National survey, collection, and conservation, 2009–2014,* by M. Kan, M. Küçükçongar, M. Keser, A. Morgounov, H. Muminjanov, F. Özdemir, C. Qualset,
www.fao.org/3/a-i5316e.pdf

FAO/ITPS. 2015. *Status of the World's Soil Resources (SWSR) – Technical Summary.* Rome.
www.fao.org/3/a-i5126e.pdf

FAO. 2014. *Building a common vision for sustainable food and agriculture – principles and approaches.* Rome.
www.fao.org/3/a-i3940e.pdf

FAO. 2014. *Global Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources.* Rome.
www.fao.org/3/a-i3849e.pdf

FAO. 2014. *The State of the World's Forests Genetic Resources.* Rome.
www.fao.org/3/a-i3825e.pdf

FAO. 2011. *Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture.* Rome.
www.fao.org/docrep/015/i2624e/i2624e00.pdf

FAO. 2011. *The State of the World's Land and Water Resources for Food and Agriculture (SOLAW) – Managing systems at risk.* FAO, Rome, and Earthscan, London.
www.fao.org/docrep/017/i1688e/i1688e.pdf

FAO/SINER-GI. 2010. *Linking people, places and products – A guide for promoting quality linked to geographical origin and sustainable geographical indications.* Rome.
www.fao.org/docrep/013/i1760e/i1760e.pdf

FAO. 2007. *Global Plan of Action for Animal Genetic Resources and The Interlaken Declaration adopted by the International Technical Conference on Animal Genetic Resources for Food and Agriculture.* Interlaken, Switzerland, 3–7 September 2007. Rome.www.fao.org/3/a-a1404e.pdf

FAO. 2007. *The State of the World's Animal Genetic Resources for Food and Agriculture.* Rome.
www.fao.org/docrep/fao/010/a1250e/a1250e.pdf

THE STATE OF THE WORLD'S BIODIVERSITY FOR FOOD AND AGRICULTURE

Sustainably using and conserving the biodiversity that supports agriculture, forestry, fisheries and aquaculture is vital to efforts to meet humanity's growing needs while protecting the planet for future generations.

The first-ever report on *The State of the World's Biodiversity for Food and Agriculture* is an essential step in creating a comprehensive picture of the state and use of this biodiversity for more sustainable, resilient food systems.

The report, set for launch in February 2019 at the Seventeenth Regular Session of the Commission on Genetic Resources for Food and Agriculture, engaged over 150 authors and reviewers, who based their analysis on 91 country reports prepared by over 1 300 contributors.

The report details the many benefits biodiversity brings to food and agriculture and highlights policies, practices and options that improve the sustainable use of biodiversity for food and agriculture and thus promote food security and nutrition, functional ecosystems, productivity and sustainability, and secure livelihoods.

BIODIVERSITY FOR SUSTAINABLE AGRICULTURE

FAO's work on biodiversity for food and agriculture

This brochure presents FAO's work on mainstreaming biodiversity as a cross-cutting theme in the agriculture, fisheries and forestry sectors. It provides examples of on-the-ground activities and highlights relevant international mechanisms. It shows how biodiversity and ecosystems benefit people in countless ways by providing food, clean water, shelter and raw materials for our basic needs. Agriculture is a major user of biodiversity but also has the potential to contribute to the protection of biodiversity.

Occupying more than one-third of land in most countries of the world, if managed sustainably, agriculture can contribute to important ecosystem functions. These include maintenance of water quality, erosion control, biological pest control and pollination. Our ability to benefit from ecosystem services in future will depend critically on how we understand, value and manage them today, both within and outside agricultural production systems. To achieve this objective, the different sectors need to work together.

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