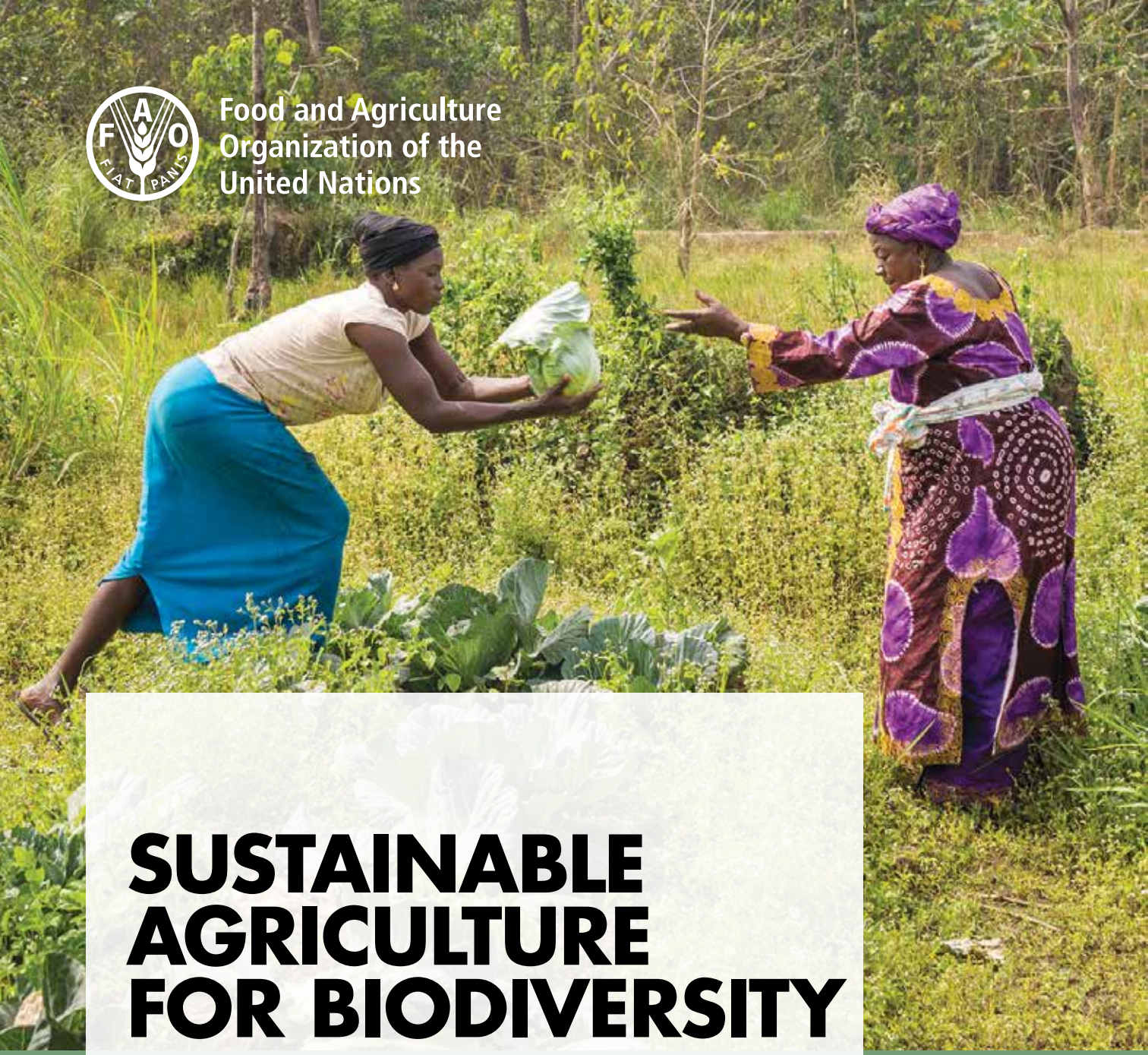

Food and Agriculture Organization of the United Nations

SUSTAINABLE AGRICULTURE FOR BIODIVERSITY

BIODIVERSITY FOR SUSTAINABLE AGRICULTURE

CONTENTS

Cover photo:
SIERRA LEONE - Farmers from a women's vegetable cooperative harvesting cabbages.
©FAO/S. Liste

THE UNITED REPUBLIC OF TANZANIA
Fishers farm fish for personal consumption and for market use.
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INTRODUCTION

BIODIVERSITY PLAYS A CRUCIAL ROLE IN FOOD SECURITY, NUTRITION, LIVELIHOODS AND IN THE PROVISION OF ECOSYSTEM SERVICES

Today's key challenge is how to increase production to meet the growing demand for food, feed and bioenergy while conserving biodiversity and reducing the pressure on natural resources and ecosystems.

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:

- 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 micro-organisms. 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 or milk performance.

- 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

BURKINA FASO
Mixed cropping of maize and mucuna for soil fertility improvement and weed control.
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plants and animals and non-living components such as soil, air and water.

'Agriculture' comprises all aspects of crop and livestock farming, fisheries, aquaculture and forestry. Agricultural biodiversity includes all the components of biological diversity of relevance to food and agriculture together with the components of biological diversity that constitute the agro-ecosystem: the variety and variability of animals, plants and micro-organisms, at the genetic, species and ecosystem levels, that sustain the functions, structure and processes of the agro-ecosystem. This diversity has been shaped by farmers and communities for millennia and remains a key element of the livelihood strategies of poor, small-scale farmers throughout the world. Agricultural biodiversity, including wild relatives of genetic resources, is a fundamental resource for the continued improvement of varieties and breeds, and needed to cope with changes.

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

MAIN MESSAGES

Biodiversity is key to food security and nutrition.

It is needed to sustainably produce enough nutritious food in the face of challenges, such as climate change and growing populations with changing diets. Production should address not only the quantity of food or calories but high nutrient values such as vitamins, minerals and other micronutrients as well. In agricultural ecosystems, maintenance of biological diversity is important both for food production and to conserve the ecological foundations necessary to sustain life and rural livelihoods.

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

The agricultural sectors together manage the largest terrestrial, freshwater and marine areas on Earth. If managed sustainably, agricultural sectors can contribute to important ecosystem functions. 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, and stewardship incentives are needed to facilitate mainstreaming of biodiversity.

As part of its commitment to agricultural biodiversity and the interaction between biodiversity and agriculture, FAO contributes through its policies, programmes and activities to the conservation and use of biodiversity for food and agriculture.

Aiming at transformative change, FAO, acting as Biodiversity Mainstreaming Platform will facilitate, in collaboration with its partners, the integration in a structured and coherent manner of actions for the conservation, sustainable use, management and restoration of biological diversity across agricultural sectors at national, regional and international levels.

KENYA
Masai pastoralists herding cattle.
©FAO/A. Vitale

BIODIVERSITY MATTERS

FAO has a long history in pursuing its goal to alleviate poverty and hunger by promoting sustainable agricultural development and the conservation and sustainable use of biodiversity for food and agriculture. In fact, the First Session of the FAO Conference, held in 1945, identified the need for fishery conservation measures, as food shortages in Europe and elsewhere after the Second World War had stimulated overfishing.

FAO's work on biodiversity aims at balancing the need to improve the food and nutrition security and livelihoods of the poor, who mostly reside in rural areas, with that of preventing the degradation, contamination and loss of natural resources and reducing the uncertainties associated with climate change. To adapt to these challenges and uncertainties, a large reservoir of biological diversity will be needed.

FEEDING A CHANGING WORLD – THE EVER-GROWING CHALLENGE

Despite global efforts on several fronts and success stories in many countries, 815 million people still suffer from chronic hunger and nearly 155 million children under the age of five years are stunted (low height for age). *The State of Food Security and Nutrition in the World 2016* indicates that food production will need to increase by 50 percent globally, to cope with the increasing population and changing dietary preferences.

The issues related to food and nutrition are complex, and increasingly countries are faced with a double burden of malnutrition. Worldwide, obesity has more than doubled since 1980. In 2016, more than 640 million adults and 41 million children under the age of 5 years were overweight, resulting in substantial national healthcare expenditures. Most of the world's population live in countries where more people die from being overweight or obese than from being underweight.

In addition, FAO estimates that up to one-third of food is lost or wasted throughout the supply chain, from initial production down to final household consumption. This is not only a loss of food available for human consumption, but it is also a waste of the production resources (land, water, energy and inputs), resulting in unnecessary pollution and greenhouse gas (GHG) emissions (FAO, 2011).

The impact of a growing 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 and health of our biodiversity and our ecosystems. Natural resources are becoming scarcer, climate is being affected, conflicts are increasing, and

PERU
Quinoa field.
FAO/A. Canahua.

people are moving away from their homelands in search of better lives.

AGRICULTURAL SECTORS – THE BIG ENEMY OR A STRONG ALLY FOR BIODIVERSITY?

Biodiversity and ecosystem services are essential in supporting agriculture in multiples ways and at all levels. These interlinkages are increasingly seen as key for livelihoods, welfare, production and development.

While biodiversity and ecosystem services are critical to agricultural sectors, these sectors are also major drivers of environmental change with significant impacts on biodiversity and ecosystem services. One main impact on biodiversity loss derives from the conversion of natural or semi-natural land into agricultural land uses, followed by the introduction of invasive alien species, including pests and diseases.

Reducing the ecological footprint of agriculture through sustainable practices can contribute to the conservation of biodiversity, habitats and ecosystem services provision.

AGRICULTURE, BIODIVERSITY AND ECOSYSTEM SERVICES – TOGETHER IS BETTER

With the increased recognition that agriculture benefits from healthier ecosystems, approaches that integrate ecosystem concerns to crop, livestock, forestry, fisheries and aquaculture practices are increasingly being devised and developed.

Food, fibre, wood, medicines, pure water and other goods are some of the material benefits people obtain from the "provisioning services" of ecosystems. These goods are sold in markets but many rural households directly depend on provisioning services for their livelihoods, indicating their importance is higher than the mere prices they fetch on markets. Forests provide more than 10 percent of gross domestic product in many countries, regardless of their level of development, but their actual value to society is much higher.

BIODIVERSITY MATTERS

Genetic resources across all agricultural sectors have been bred and selected to provide more of those services to directly improve human well-being.

Agriculture needs a number of ecosystem services to produce these goods. These are "regulating services" and serve to maintain the quality of air and soil, providing flood and disease control, and pollinating crops, to name a few. Apart from being a user of these services, agriculture can contribute in providing back some of these same services to the communities and to the environment. These include:

- Forest restoration, for example, contributes to air and water purification, carbon sequestration and storage.

- Well maintained agricultural and forest lands reduce risks and damage from floods, storms, tsunamis, avalanches, landslides and droughts.

- Vegetation cover prevents soil erosion and ensures soil fertility through natural biological processes such as nitrogen fixation.

- Livestock maintains balanced ecological mosaics through browsing, grazing, nutrient cycling, and the dispersal of seeds.

- Well-managed fisheries contribute to sustained ecosystem services from both freshwater and marine systems, with trophic webs and provisioning and regulating services extending well beyond the scope of the target stocks.

- Natural enemies (predators, parasites and pathogens) of crop pests provide a regulating service called biological control that can drastically minimize the use of agrochemicals, thereby reducing adverse effects on the environment, such as contamination of natural resources, and on human health.

Pollination is essential for the development of fruit, vegetables and seeds. Insects, some birds, bats and wind pollinate plants and trees in both agricultural and natural ecosystems. In agro-ecosystems, pollinators are essential for orchard, horticultural and forage production, as well as for the production of seeds for many root and fibre crops. Pollinators are responsible for about 35 percent of the world's crop production, increasing outputs of about 75 percent of the leading food crops worldwide. Animal pollination is a regulating service provided by biodiversity mostly living in natural or semi-natural areas outside farms.

The provision of living spaces for plants or animals and maintaining a diversity of plants and animals, belong to the "supporting services" that ecosystems provide. They underlie all ecosystems and support their existence and their ability to provide the other services. As an example, tropical, temperate and boreal forests offer very diverse habitats for plants, animals and micro-organisms. Notwithstanding such a relevant role, progress towards sustainable forest management still needs strengthening, and there is continuing loss and degradation of forests in many developing countries.

The conservation and sustainable use of genetic diversity can provide the options needed to cope with stresses, supporting the capacity of agro-ecosystems to maintain and increase their productivity and to adapt to changing circumstances. Ensuring these abilities is vital to food security.

Agriculture and other ecosystems are also important for the non-material benefits they provide to people. These "cultural services" include aesthetic inspiration, cultural identity, sense of home, and spiritual experience related

MOROCCO
Honeybee on a sunflower.
©FAO/A. Senna

to the natural environment. Typically, opportunities for tourism and for recreation are also considered within this group. Cultural services are deeply interconnected with one another and to provisioning and regulating services. For example, small-scale fishing is not only about food and income, but also about fishers' way of life. In many situations, cultural services are among the most important values people associate with nature, and it is therefore critical to understand them.

Some ecosystem services are more easily appreciated than others. Those that we consume directly, such as food and raw materials, are valued in markets. Others such as biological control, pollination and nutrient cycling play vital life-supporting roles, but are less easily valued. This lack of appreciation threatens the continuity of such services. Our ability to enjoy ecosystem services in the future depends critically on how we understand, value and manage them.

OUR ABILITY TO ENJOY ECOSYSTEM SERVICES IN THE FUTURE DEPENDS CRITICALLY ON HOW WE UNDERSTAND, VALUE AND MANAGE THEM

PROS AND CONS: STORIES OF COEXISTENCE

Farming uses large quantities of water, and at the same time has strong impacts on water flow regulation. Management of farmland can both contribute to flooding, or – as in the case of the "Ganges Water Machine" – can be seen as a region-wide mechanism to control water flows but one which alters both riverine and downstream fish habitats and production.

Forests influence the amount of water available and the timing of water delivery. Stream-flow regulation by forests is the result of processes in the forest canopy, on the surface and below the ground – a combination of interception, transpiration, evaporation, evapotranspiration and infiltration. Accordingly, sustainable forest management is key to the regulation of water flows.

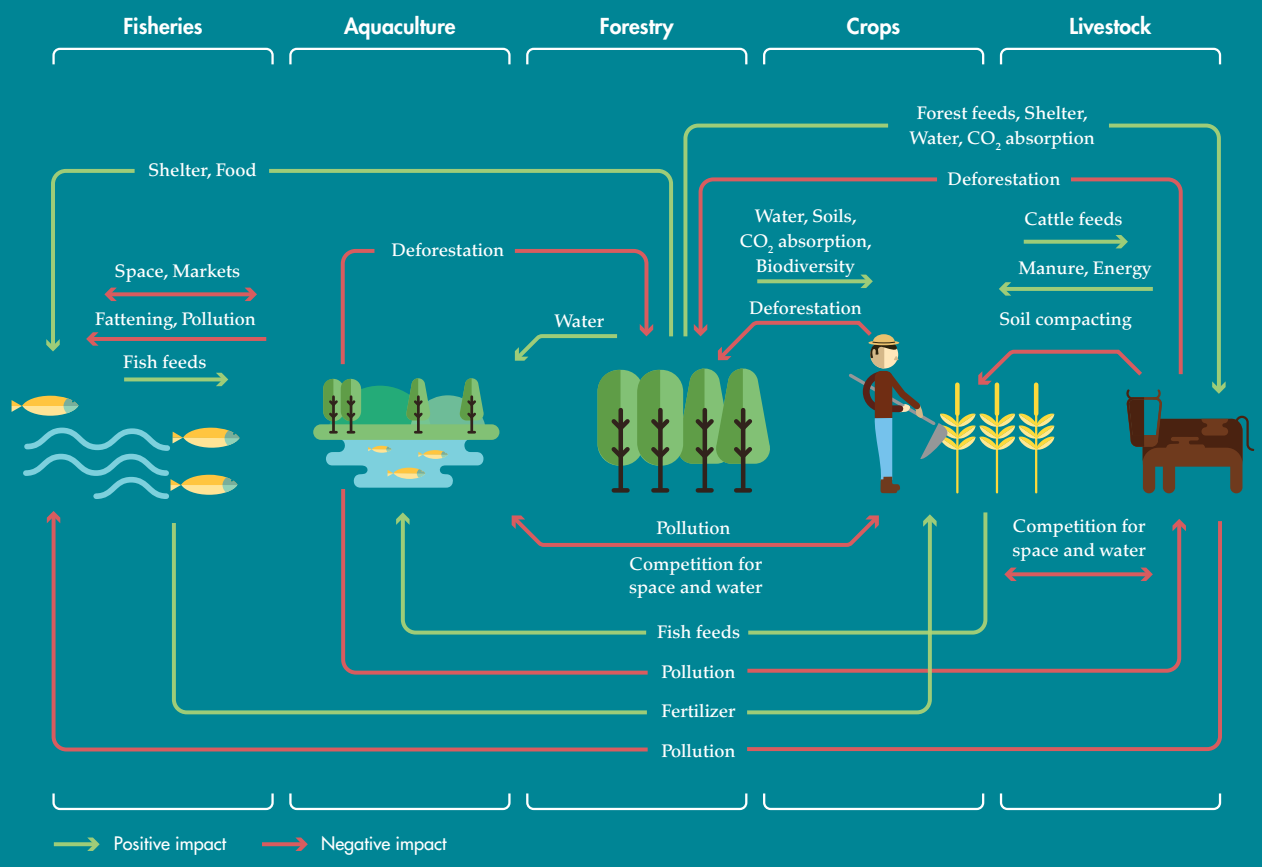
Food security, food diversity, human nutrition and even food prices all rely strongly on animal pollination, and yet pollinators are under stress from factors including habitat destruction and unsustainable agricultural practices such as intensification and pesticide misuse. There is renewed interest in helping nature provide pollination services through best agricultural management practices that support wild pollinators. Such practices include planting hedgerows, encouraging plant diversity, mulching and the wise/reduced use of pesticides.

Important freshwater plants such as water lilies need pollinators to reproduce. Thus, pollinators help to maintain the balance of the freshwater systems and, indirectly, support fisheries.

Animal excreta can be an important source of nutrients and maintain soil fertility in grazed grasslands and croplands, especially in developing countries. Globally, about 15 percent of the nitrogen applied to crops comes from livestock manure. Conversely, livestock can cause soil erosion and degradation as a combination of overgrazing, pedo-climatic factors, and other management practices (fire suppression, clear-cutting). Livestock exclusion and rotational or rational grazing can help to avoid soil degradation or promote restoration.

Greenhouse gas (GHG) emissions associated with entire livestock supply chains amount to 7.1 gigatonnes of carbon dioxide equivalent (CO_2eq) per year – or 14.5 percent of all human-caused GHG releases. Some of the GHG emissions from livestock are associated with direct and indirect land-use change, which affect carbon stocks in soil and vegetation and their sequestration potential. Conversely, grassland

SELECTED SYNERGIES (IN GREEN) AND CONFLICTS (IN RED) AMONG THE AGRICULTURAL SECTOR



carbon sequestration could significantly offset emissions, with global estimates of about 0.6 gigatonnes of CO_2eq per year.

The oceans and aquatic systems are important GHG sequesters and sinks. Oceans currently take up about one-third of the excess CO_2 released into the air and some 93 percent of the earth's carbon dioxide is stored in the oceans. Related global warming and acidification can affect fisheries and aquaculture through changes to biological processes and shifts in the distribution of fisheries, sea-level rise, coral bleaching, extreme events, disease and post-harvest risks, for example. Fisheries and aquaculture can support carbon sequestration and storage through maintaining "blue carbon" sinks (peatlands, mangrove forests, seagrass beds, and other vegetated ocean habitats) as well as through carbon sequestering products, such as molluscs and seaweed.

Crop production relies not only on genetic diversity within and between crop species, but also on associated biodiversity in agro-ecosystems. Pests, diseases and weeds limit crop production, and are themselves limited by the action of their natural enemies, mostly arthropods and micro-organisms. Biological control is a way to reduce pesticide use and enhance biodiversity, through an ecosystem approach, while ensuring production.

FAO'S HISTORY IN THE CONSERVATION AND SUSTAINABLE USE OF BIODIVERSITY

Since its inception, FAO has provided an intergovernmental platform where biodiversity-related policy is discussed and relevant agreements are negotiated and adopted by its Members. These include:

- the International Plant Protection Convention, adopted in the early 1950s;
- the 1995 Code of Conduct for Responsible Fisheries;
- the International Treaty on Plant Genetic Resources for Food and Agriculture (Treaty) adopted in 2001.

FAO assists its Members in the implementation of global action plans on plant, animal and forest genetic resources adopted under the aegis of FAO's Commission on Genetic Resources for Food and Agriculture. The Organization also manages a broad range of programmes and activities to enhance sustainable agricultural systems and management practices:

- promotion of mixed agricultural systems such as rice–fish farming and agroforestry;
- participatory training for integrated pest management;
- pollination management;
- advice on soil and water conservation;
- guidance on best practices for fisheries management and aquaculture development;
- promotion of technologies and management options of grasslands and forage resources in arid, semi-arid and humid tropical ecosystems.

Throughout the years, FAO has addressed legal and economic aspects of agricultural biodiversity, and sought to capitalize on its multidisciplinary expertise through an integrated approach to biodiversity conservation and sustainable use. Through its work as a specialized UN organization, FAO has had a leading role assisting countries in the implementation of biodiversity-related agreements of relevance to food and agriculture. These include the International Treaty on Plant Genetic Resources for Food and Agriculture, the Convention on Biological Diversity (CBD), and the Convention to Combat Desertification (CCD).

The Conference of the Parties (COP) to the CBD recognizes the "specific nature of agricultural biodiversity and its distinctive features and problems requiring distinctive solutions", and FAO's role in supporting the programme of work. FAO is a leading partner in three cross-cutting initiatives: Conservation and Sustainable Use of Soil Biodiversity; Biodiversity for Food and Nutrition; and International Pollinators Initiative.

After decades working on sectoral and cross-sectoral themes related to natural resources management, FAO's programmes have become

PERU
Workers in one of the 11 FAO-assisted community forest nurseries tending Molle, a drought-resistant native tree that grows well in poor soil and arid climates.
©FAO

more integrated. Projects on agroecology or integrated landscape and watershed management and restoration support have improved production practices that reduce pressure on natural habitats and related resources.

FAO's Strategic Framework recognizes the key role of biodiversity and ecosystem services in developing sustainable agricultural practices in all sectors. Today, FAO works to support countries in the implementation of the 2030 Agenda for Sustainable Development and the Sustainable Development Goals (SDGs), which clearly recognize the centrality and interconnectedness of food security, biodiversity and sustainable agricultural development. Sustainable agriculture cuts across several SDGs:

- SDG 2 on ending hunger and promoting sustainable agriculture;
- SDG 14 on sustainable use of oceans and marine resources;
- SDG 15 on protecting sustainable use of terrestrial ecosystems and halting desertification and biodiversity loss.

FAO HAS HAD A LEADING ROLE ASSISTING COUNTRIES IN THE IMPLEMENTATION OF BIODIVERSITY-RELATED AGREEMENTS

FACTS AND FIGURES

- **815 million** people are still **undernourished**.
- By 2050, the **world population** will be **nearly 10 billion**, driven by growth in developing countries, with more people living in urban settings.
- World **agricultural production has grown** on average between **2 and 4 percent per year** over the last 50 years, while cultivated land has grown by only one percent annually, indicating increased efficiency.
- As of today, **from the 8800 livestock breeds known, 7 percent are extinct, 24 percent of breeds are at risk of extinction** and 59 percent are classified as being of unknown risk status because of lack of data.
- More than **70 percent of reporting countries** have *in situ* **conservation measures** for animal genetic resources in place. However, less than 20 percent consider their measures to be comprehensive.
- **Foods of animal origin** contain protein, iron, zinc, vitamin A and vitamin B12, which are of special **nutritional importance** to children.
- More than **580 aquatic species** used for global food production come from **aquaculture**.
- **8 crop species** (barley, beans, groundnut, maize, potatoes, rice, sorghum and wheat) provide **53 percent of average daily calories** consumed, and 5 animal species (cattle, sheep, goats, pigs and chickens) provide 31 percent of average daily protein consumed, and 3 crop species (wheat, rice and maize) represent 48 percent of average daily calories consumed.
- About **3.6 million** crop accessions (collections of plant material from a particular location) are conserved **in gene banks** by 71 countries and 12 international centres, with about half the total holdings belonging to nine major food crops.
- More than half of the **germplasm** used in crop breeding and pre-breeding activities was obtained from regional or international networks or the gene banks of international centres, thus demonstrating clear **interdependence**.
- Although **crop wild relatives** represent about **13 percent** of the world's **gene bank holdings**, about 70 percent of such species are still missing.
- **Protected areas** and botanical gardens have **expanded by 30 percent** and increased the conservation of crop wild relatives.
- Since 1996, at least **240 000 new plant materials** have been collected and added to ex situ **gene banks**.
- Globally, **524 million hectares of forests** have been primarily designated for biodiversity **conservation**.
- Almost **8 000 species** of forest trees and other woody plants (scrubs, palms and bamboo) are used for various purposes in 86 countries around the world but only about **2 360** of them are currently actively **managed**.

THAILAND
A wetland area with a rich inland fishery.
©FAO

- Roughly **one-third of the food** produced in the world for human consumption is **lost or wasted** every year.

- Agriculture sectors, forestry, aquaculture and soils can all substantially contribute to **balancing the global carbon cycle**.

- **Mountain areas host 25 percent of terrestrial biodiversity**, including the gene pool of globally important crops such as maize, potatoes, barley, sorghum, tomatoes and apples.

- **Grasslands contain 11 percent of the world's endemic bird areas** and about 750 genera and 12 000 **species of grass**, and contribute to the maintenance of **pollinators** and other insects that have important regulating functions.

- **Genetic erosion** narrows our ability to adapt our global food system to **challenges** such as population growth, emerging diseases and climate change.

- **Policy** environments frequently disadvantage the traditional production systems that typically harbour adapted livestock species and breeds, thus fostering **genetic erosion**.

1 074, or **12 percent**, of the world's recorded **livestock breeds** are considered to be adapted to drylands.

- **Nutrient cycling** accounts for some 51 percent of the **economic value** of all non-provisioning ecosystem services. Livestock plays a large role in this.

- Many of the world's most **biologically diverse** areas are also the most **culturally diverse**.

- **Cultural values** can be **economically important**. For example, Madura cattle in Indonesia that perform in cultural events have been found to attract prices 2 to 3.5 times higher than animals of the same breed that do not take part in such events.

- 33 percent of our **soils** are **degraded** globally.

- **Pollinators** are responsible for **35 percent of global crop production** and play a fundamental role in food production.

FAO'S FIELDS OF WORK

FAO has developed a common vision for sustainable food and agriculture that includes five elements aimed at reducing environmental impact. The vision, called Sustainable Food and Agriculture (SFA), helps address trade-offs and synergies between sectors and across sustainability dimensions.

The SFA highlights the vital importance of the conservation and sustainable use of biodiversity and ecosystems in diverse and integrated landscapes and seascapes for the functioning of agricultural sectors. It does this through improving efficiency in the use of resources; conserving, protecting and enhancing natural ecosystems; protecting and improving rural livelihoods; enhancing the resilience of people, communities and ecosystems; and promoting responsible and effective governance mechanisms.

Five crucial elements of governing transformation towards sustainable food and agriculture in the framework of the 2030 Agenda are:

- country ownership and leadership;
- cross-sector, integrated approaches and policy coherence;
- multistakeholder approaches and partnerships;
- alignment of investments, public and private;
- focus on actions with measurable results.

POLICY DEVELOPMENT AND DIALOGUE

FAO hosts more than 70 instruments and mechanisms on the sustainability of sectoral and cross-sectoral issues, many of them referring to biodiversity. It 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.

The 1995 **Code of Conduct on Responsible Fisheries**, which has helped shape the fisheries and aquaculture world for more than 20 years, is based on due respect for ecosystems and biodiversity as part of effectively balancing conservation, management and development of living aquatic resources. The 2001 Reykjavik Conference on Responsible Fisheries in the Marine Ecosystem built on this, leading to the implementation guidelines for the Ecosystem Approach to Fisheries and to Aquaculture, respectively.

The FAO-WHO **International Code of Conduct on Pesticide Management** (the Code) provides standards of conduct

BANGLADESH
A market vendor near Gobrakura Village selling potatoes, okra, eggplant, lotus leaves and other vegetables.
©FAO/G. Napolitano

on sound pesticide management for all stakeholders (including government authorities and the pesticide industry) involved in the pesticide life cycle from formulation to disposal.

If misused, pesticides suppress the natural pest control mechanisms of agro-ecosystems and exacerbate pest problems. The adverse effects of pesticides on wildlife and biodiversity, such as the decline in the populations of birds, insects, amphibians and aquatic communities, have been widely documented. This code is supported by technical guidelines developed by the FAO–WHO joint Panel of Experts on Pesticide Management. Since 2007, addressing the use of highly hazardous pesticides and promoting good agricultural practices to minimize the use of agrochemicals have been a special focus area for FAO.

The **International Plant Protection Convention**, hosted by FAO, is a multilateral treaty for the application of phytosanitary measures by governments to protect their plant resources from harmful pests, introduced through international trade. The mandate extends to the protection of both cultivated plants and wild flora and their habitats and ecosystems. The international standards, guidelines and recommendations are recognized by the World Trade Organization Sanitary and Phytosanitary Agreement.

The International Treaty on Plant Genetic Resources for Food and Agriculture

The Treaty is an FAO international agreement promoting the conservation and sustainable use of crop genetic diversity. It makes a fundamental contribution to helping achieve food security for all and helps countries develop sustainable agriculture and support farmers and researchers adapt crops to the effects of climate change. As of October 2016, there are 140 Contracting Parties to the Treaty and the United States of America will join by the end of 2016.

The Treaty is now a fully operational global system. Through its Multilateral System for Access and Benefit-sharing,

FAO'S FIELDS OF WORK

Member Countries can easily exchange material and access the largest global pool of genetic diversity for food security and sustainable agriculture. The Treaty's gene pool has already more than 1.8 million genetic samples available for being accessed. Since 2007, there have been 3.25 million exchanges of genetic material in support of agricultural development. The Treaty's Global Information System is being developed to create the global entry point to information and knowledge for strengthening the capacity for conservation, management and utilization of crop diversity.

Since 2009, the Treaty has supported high-impact actions, financed through the Benefit-sharing Fund, that focus on family farming in developing countries by addressing food security, adaptation to climate change and agricultural biodiversity. Through this mechanism, the international community advances Treaty implementation while progressing in the realization of the Sustainable Development Goals. Impact so far includes:

- 1 000 000 people across 45 developing countries have benefited from activities directly or indirectly, most of whom are smallholder farmers.

- 22 000 people in the developing world have been trained in the conservation, management and use of plant genetic diversity through more than 300 workshops.

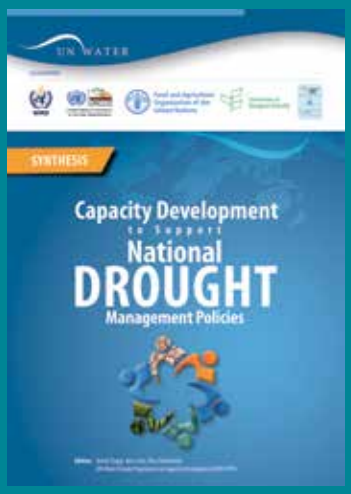
- More than 1 000 crop varieties conserved and available to farmers through community seed banks, seed fairs and farmer exchange visits.

Partnering for Treaty implementation: the case of Malawi

With increased climatic uncertainty, sustaining on-farm biodiversity is pivotal for mitigating the effects of adverse weather events and thereby for food security. The Treaty has engaged a wide range of delivery partners in this endeavour including governments, research institutions, NGOs and grassroots organizations. Treaty partners in Malawi promoted the re-introduction in farming systems of locally-adapted varieties available in the Treaty's Multilateral System of strategic crops such sorghum, yams, and pearl millet, finger millet and cowpea.

The project strengthened seed multiplication and distribution systems through the formation of 38 farmers groups involving over 4 000 farming families. A total of 12 climate-ready varieties of target crops have been identified and reintroduced through farm field days and additional local biodiversity, previously unavailable in the national gene bank, has been collected and evaluated. Training and capacity building was delivered to more than 6 000 stakeholders among farmers, researchers, extension workers and policy makers.

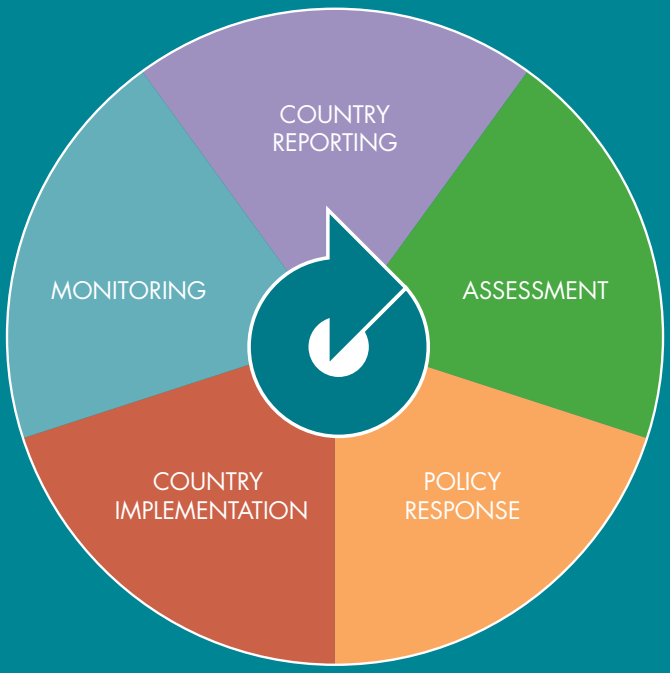
As a result, 2 000 households are cultivating locally adapted varieties and have reported higher diversity on-farm, higher yields with low inputs and diversification of the family diet with higher nutrition levels. The introduction and safeguarding of locally adapted varieties has improved the capacity of family farms to cope with droughts and other climate-related events and to develop sustainable agricultural practices.



This publication highlights a joint programme to support countries in their national drought management policies.

FAO'S POLICY CYCLE OF WORK

FAO's policy cycle starts with global assessments based on country data and reports. Gaps identified during the assessment lead to the adoption of policy responses, such as sectoral treaties, codes or global plans of action, which exist for animal, plant, fisheries, aquaculture and forest genetic resources already, or global guidelines on cross-cutting issues (e.g. climate change, nutrition). FAO's technical units support countries in the implementation of the instruments though projects, development of technical guidelines, partnerships, etc. Countries report back to FAO, at regular intervals, on progress in the implementation of the instrument, based on agreed targets and indicators.



Assessment and policy response led by the Commission on Genetic Resources for Food and Agriculture: the example of animal genetic resources

FAO's work in the field of animal genetic resources management addresses technical, policy and institutional issues, and takes into account the interactions with other aspects of natural resource management, production system dynamics and general economic development.

The State of the World's Animal Genetic Resources for Food and Agriculture (2007) identified significant gaps in capacity to manage animal genetic resources, particularly in developing countries. In response, the international community adopted the Global Plan of Action for Animal Genetic Resources (GPA) at the International Technical Conference on Animal Genetic Resources for Food and Agriculture in September 2007. The GPA includes 23 strategic priorities for action grouped into four priority areas: characterization and monitoring; sustainable use and development; conservation; and policies, institutions and capacity-building. The Second Report on the State of the World's Animal Genetic Resources for Food and Agriculture (2015) provided the basis for a review of the GPA, which reconfirmed the validity of the four strategic priorities.

FAO collaborates with a range of partners to facilitate, promote and support policy dialogue at global, regional and country levels, and to assist in the national implementation of international agreements. These partnerships range from global, UN-programmes to regional and national initiatives, and are sectoral as well as cross-sectoral, for example the Mountain Partnership, the Collaborative Partnership on Wildlife and the Collaborative Partnership on Forests.

FAO'S FIELDS OF WORK

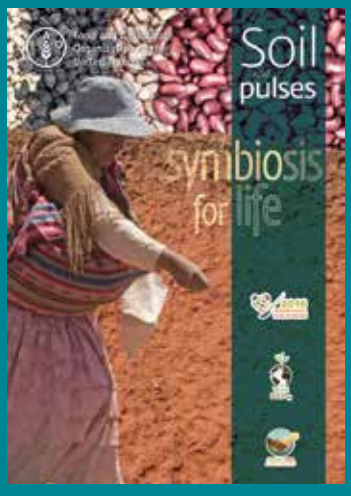
UN–Water Capacity Development Initiative
This programme is jointly implemented by FAO, the World Meteorological Organization, the United Nations Convention to Combat Desertification and the UN–Water Decade Programme on Capacity Development to support national drought management policies.

Biodiversity, and the ecosystem services it supports, play a key role in regulating the water cycle. This is as a source of genetic material to support the development of drought-resistant crops and livestock and wild resources as an emergency source of food during a period of crisis. More frequent, long and intense drought is affecting agricultural production and food and nutrition security, as well as other activities such as nature-based tourism. The programme assists countries to capture these critically important dimensions in vulnerability assessments and drought mitigation measures, and minimize risk.

Global Soil Partnership (GSP) – protecting biodiversity through sustainable soil management
The 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 increase food availability and the soil's ability to buffer against climate change effects.

The GSP strives to raise awareness on the role of sustainable soil management in safeguarding biodiversity, highlighting that soils are a key reservoir of global biodiversity.

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, the GSP supports soil biodiversity enhancement though a range of measures. These include monitoring soil biodiversity; maintaining or enhancing soil organic matter levels; the regulation of authorization and use of pesticides in agricultural systems; the use of nitrogen fixing leguminous species; 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 in the agricultural frontier.



Linking the role of pulses and soil for food security and nutrition.

Globally Important Agricultural Heritage Systems (GIAHS)
GIAHS is an FAO programme working over a decade on identifying and conserving agricultural systems that have supported food security and livelihoods of small-scale family farmers over centuries together with their ingenious knowledge and technology, agro-biodiversity, unique culture and outstanding landscapes. These agricultural systems highlight their capacity to use natural resources sustainably, and the harmonious relationship with their surrounding environment. At present, 50 sites in 20 countries are designated as GIAHS.

THE PHILIPPINES
Ifugao rice terraces.
©FAO/GIAHS Secretariat

GIAHS applies a dynamic conservation approach aimed at emphasizing the balance between conservation and agricultural/socio-economic development, while conserving traditional and cultural values interrelated with the farming activities. The concept is based on the idea that the endurance of these systems has been possible due to their capacity to adapt to changing social, environmental and economic conditions. However, the resilience of these systems is continuously threatened by external and internal factors, such as population growth, migration to urban areas and abandonment by young generations, scarcity of natural resources, modern and high scale agriculture, among others. GIAHS can provide economic solutions to small-scale farmers depending on traditional systems through the establishment of economic alternatives (e.g. agro-tourism, branding of products, leisure activities).

Through its holistic approach, GIAHS highlights the close linkage between agriculture, culture and biodiversity conservation. Communities living in the GIAHS sites are largely dependent on local biodiversity as a source of well-being, and therefore have maintained and adapted their systems. The maintenance of biodiversity has allowed these systems to increase their resilience, because species are able to adapt to changing conditions. In particular, GIAHS sites are examples of how agriculture can be a tool for biodiversity conservation, when the relationship between people and nature benefits from practices that are based on a sustainable use of biological and genetic resources.

Sustainable Food Systems Programme (SFSP)

The Programme, developed initially by FAO and UNEP, is now part of the 10-Year Framework of Programmes on Sustainable Consumption and Production Patterns (10YFP), adopted in Rio +20. It brings together various initiatives and work streams, to catalyse action and develop multi-stakeholder

FAO'S FIELDS OF WORK

engagement for the uptake of more sustainable consumption and production practices across food systems and throughout the food value chain, from farm to fork. The ten year Framework Programmes embrace the interconnectedness of all food-related activities and the environment. Further, it acknowledges that the production and consumption of food is a dynamic process involving multiple inputs, outputs and diverse stakeholders. It also recognizes the diversity of food systems and their impacts, including from environmental, economic, social, health-related, ethical and cultural perspectives. This presents a significant opportunity to accelerate the shift to sustainable consumption and production practices more generally. The Programme supports the implementation of targets and goals agreed under relevant multilateral environment agreements, such as the Aichi targets under the Convention on Biological Diversity (CBD), as well as global sustainable development commitments, in particular the 2030 Agenda.

The programme gathers knowledge and best practices to improve sustainability of food systems from production to consumption. It gives particular attention to knowledge and capacity building, markets, as well as cooperation between actors. In the programme, FAO has placed emphasis on the need to better integrate biodiversity both as an objective and as a means to improving sustainability. Successful examples include the valorization of ecosystem services, of products linked to specific ecosystems, like mountains, or to specific territories and/or species/varieties, such as the geographical indications of provenance. Such systems can often bring both environmental, economic and social benefits, while and indeed by sustainably managing biodiversity.

Livestock Environmental Assessment and Performance (LEAP) Partnership

An increasing number of studies quantify GHG emissions from feed and livestock production while overlooking impacts on biodiversity tied to land use. The LEAP Partnership called for harmonized assessment methods of these complex impacts. Around 30 percent of ice-free land on Earth is used for livestock production, which frequently results in modifications of biodiversity habitats. Impacts can be negative, such as conversion of forest to pasture, however ecosystems can also benefit from these modifications such as extensive livestock production which maintains grassland habitats hosting a unique pool of wild species and providing ecosystem services. A group of international experts in LEAP produced the Principles for the assessment of livestock impacts on biodiversity, which are intended to guarantee a minimum level of soundness, transparency and completeness to such assessments. The principles are relevant to a variety of stakeholders, scales and assessment frameworks such as life cycle assessment and pressures-state-response. LEAP is currently moving from principles to key indicators, guidelines, road testing and dissemination.

National Strategy for Plant Genetic Resources for Food and Agriculture (PGRFA)

The Strategy, articulated and implemented collaboratively among the widest range of stakeholders, is the overarching

ACCESS TO AFFORDABLE QUALITY SEEDS AND PLANTING MATERIALS IS ESSENTIAL FOR IMPROVING FOOD SECURITY

MEXICO
A wooded area containing useful timber, a main source of income for rural families.
©FAO/A. Conti

framework itemizing a country's vision, goals and objectives and the requisite action plan for the conservation and sustainable use of plant genetic resources for food and agriculture. It is therefore a very useful tool for country-level implementation of the Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture, which, with its 18 priority activities, is the internationally agreed strategic framework for the conservation and sustainable use of the plant genetic diversity on which food and agriculture depends.

The Guidelines for Developing a National Strategy for Plant Genetic Resources for Food and Agriculture, is a voluntary reference tool endorsed by FAO's Commission on Genetic Resources for Food and Agriculture. Primarily intended for use by policy-makers and scientific and technical practitioners, they consist of a sequence of suggested stages and methods for both the formulation and implementation of a national PGRFA strategy. These steps include: the establishment of a coordinating mechanism; the articulation of the contents; and the finalization and presentation of the document.

The Guidelines have aided Botswana, Egypt, Iran (Islamic Republic of), Jordan, Lebanon, Lesotho, Malawi, Mozambique, Rwanda, the United Republic of Tanzania, and Zambia in formulating national PGRFA strategies.

National seed policy formulation

Farmers' access to affordable quality seeds and planting materials of the most suitable crop varieties is essential for improving food security and nutrition as well as the livelihoods of farming communities. In many developing countries, the lack of adequate seed policies reduces opportunities for smallholders to obtain quality seeds of the crops most suited to their farming systems, conditions and needs.

FAO'S FIELDS OF WORK

A national seed policy provides an overall regulatory framework to guide government action and explains the roles of relevant stakeholders in effective seed systems in both formal and informal sectors. In the past seven years, FAO has assisted 25 countries in formulating seed policy, harmonizing rules and regulations for seed production and trade, and in training and capacity development.

As part of this effort, FAO has recently published the *Voluntary Guide for National Seed Policy Formulation* under the auspices of FAO's Commission on Genetic Resources for Food and Agriculture. The guide describes participatory methods for discussing: crop variety development, seed production, seed quality assurance, agricultural extension, seed marketing, seed import and export, seed enterprise development, seed value chain, seed security, capacity building and seed legislation.

Advancing conservation, sustainable management and restoration of dryland forests and agrosilvopastoral systems worldwide

At its twenty-third session, in Rome, July 2016, the Committee on Forestry agreed to establish a Working Group on Dryland Forests and Agrosilvopastoral Systems, recognizing their critical importance in all regions. The objectives of this working group include: (i) to review and report on the status, trends, issues and developments in dryland forests and agrosilvopastoral systems, and make recommendations; and (ii) promote scaling-up of the adoption of good practices for their protection, sustainable management and restoration, enhancing environmental and socio-economic resilience and sustainable livelihoods. This work will build on and consolidate the results and approaches applied in FAO's programme in different dryland regions with partners such as the Africa's Great Green Wall – Action Against Desertification.

In addition, FAO's Dryland Restoration Initiative has supported the production and dissemination recently of the "Global guidelines for the restoration of degraded forests and landscapes in drylands: building resilience and benefiting livelihoods", which aims to help decision-makers and practitioners design, implement and monitor effective programmes that address the needs of multiple stakeholders. As part of this initiative, FAO is developing an interactive web-portal to support practitioners, project managers, decision-makers and policy-makers in compiling and analysing data, and capturing and sharing lessons learned.

FAO HAS ASSISTED 25 COUNTRIES IN FORMULATING SEED POLICY AND HARMONIZING RULES AND REGULATIONS

ZIMBABWE
Farmers with donkeys ploughing a field.
©FAO/E. Raizman

Incentives for ecosystem services (IES)

Given the complex nature of mainstreaming biodiversity conservation across multiple sectors, single measures are not sufficient to address threats to biodiversity and sustainable use, or enable associated improvements in productivity and food security. An appropriate mixture of multiple measures has been encouraged by the CBD to combine better and enforceable legal frameworks, and include socio-economic incentives to reduce opportunity costs of biodiversity conservation for poor farmers.

FAO supports countries through IES in agriculture to develop integrated measures. These measures combine: (i) the removal or mitigation of perverse incentives, (ii) the improvement of regulation design and the participatory nature of its enforcement, with (iii) public investments in improved productivity and market access, (iv) private sector investments led by flexible or early compliance with regulation, certification and value chain development, and (v) voluntary investments in social initiatives.

The programme tracks progress on improved institutional coordination to mainstream biodiversity and agro-ecosystem services across sectors. It also helps to align investments to provide farmers with incentives that allow them to better comply with biodiversity conservation goals, and to share experiences, best practices and case studies of coherent and comprehensive policy frameworks and of incentive measures. Through its regional dialogue events (2015 in Latin America, 2016 in East Africa and 2017 in Asia), the Swiss-funded project has fostered collaboration and

FAO'S FIELDS OF WORK

discussion to distil common elements of successful IES financing approaches.

Mainstreaming ecosystem services and biodiversity into farm production and management

Approaches that can address both the negative externalities of conventional production systems and assist resource-poor farmers in overcoming sustainability challenges have a central common thread: they recognize that agriculture and food systems are biological and social systems. Promoting ecosystem-based approaches to agriculture – that build on, and strengthen natural services such as pollination, soil fertility and ecological management of pests and weeds – reduces the environmental pressure of farming on natural ecosystems and biodiversity.

This fact sheet summarizes how to protect, enhance and value ecosystem services and so boost food security.

The technical guidance document on *Mainstreaming ecosystem services and biodiversity into agricultural production and management in East Africa* was co-published by FAO and the CBD in 2016. The document aims to assist policy-makers across ministries to mainstream biodiversity and ecosystem services into country national biodiversity strategies and action plans (NBSAPs), towards achieving the Aichi Biodiversity Targets. The document includes a section on policy measures, from Kenya and elsewhere, that offer examples of entry points for harnessing synergies between agricultural practices, sound chemical management and biodiversity conservation.

A policy dialogue workshop organized in Nairobi, Kenya, in May 2016 resulted in the preparation of key suggestions for uptake by the Kenya NBSAP, and the creation of a multisectoral taskforce with the aim to mainstream this approach across relevant sectors in the Kenyan government.

A similar process is under way in the Pacific, where the Secretariat of the Pacific Regional Environment Programme and FAO organized a side event in September 2016, to showcase good cross-sectorial policies on preservation of biodiversity in Niue and Samoa. This led to a national training workshop to enhance collaboration between the ministries of environment and agriculture held in Samoa in October 2016.

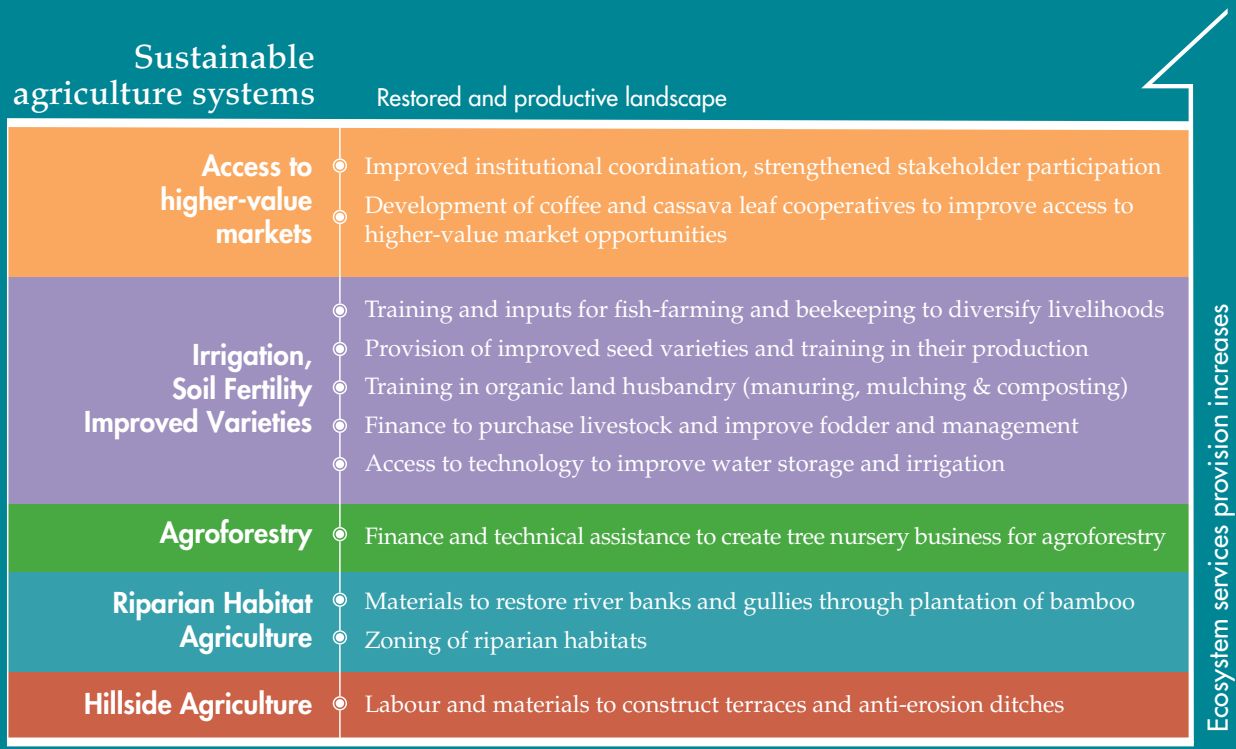
MONITORING TARGETS AND MEASURING PROGRESS

Through global assessments and databases, FAO monitors the implementation of instruments and the state of resources. It maintains global databases on land, forest, fisheries and aquaculture, and water, on agricultural inputs such as fertilizer and pesticide use, and on practices such as conservation and organic agriculture. It reports regularly on the state of food insecurity, forest resources, fisheries and aquaculture, plant, animal, forest and aquatic genetic resources, land use – and on the state of soil and water.

The State of Fisheries and Aquaculture

Prepared every two years, this flagship publication reports on the condition of our global fisheries. It aims to provide policymakers, civil society and those whose livelihoods depend on the sector, a comprehensive, objective and global view of capture fisheries and aquaculture and plays a

MEASURES TO BOOST ECOSYSTEM SERVICES FOR SUSTAINABLE AGRICULTURE SYSTEMS



frontline role in monitoring and reporting on specific targets relevant to its mandate under Sustainable Development Goals 2 and 14.

The Global Forest Resources Assessment (FRA)

The FRA is the most comprehensive assessment of forests globally. FAO has been monitoring the world's forests at 5 to 10 year intervals since 1946. FRA reports are now produced every five years in an attempt to provide a consistent approach to describing the world's forests and how they are changing. Its aim is to assess all the benefits that come from forest resources. It examines the current status and recent trends for about 90 variables covering the extent, condition, uses and values of forests and other wooded land. The results are presented according to the seven thematic elements of sustainable forest management, including conservation of forest biodiversity. In addition to FRA, FAO assists countries in strengthening their national forest monitoring systems. Global and national data on forests, forest conditions and trends provide a basis for assessing the role of forests in conserving biodiversity, providing ecosystem services and sustaining livelihood and economic opportunities.

The State of the World's Biodiversity for Food and Agriculture (in preparation)

After the sectoral State of the World reports on plant, animal and forest genetic resources, the State of the World's Biodiversity for Food and Agriculture report is being developed under the aegis of FAO's Commission on Genetic for Food and Agriculture,

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on the basis of national, regional and global data. It describes the state of the biological diversity present in, or of importance to agricultural, pastoral, forest and aquatic production systems. Its scope encompasses the variety and variability of animals, plants and microorganisms, at the genetic, species and ecosystem levels that sustain the structure, functions and processes of production systems. This diversity has been shaped by farmers, pastoralists, forest dwellers and fishers for hundreds of generations and reflects the diversity of both human activities and natural processes. In addressing all biodiversity relevant to food and agriculture, the flagship publication presents a broad perspective on the contributions made by biodiversity for food and agriculture to food security and nutrition, sustainable production and the provision of ecosystem services.

FAO supports countries in improving their statistical and monitoring capacities related to the agricultural sectors. FAO's strength in statistics and other data has positioned FAO as a 'custodian' of 21 SDG indicators (plus contributing to six), including some referring to the CBD's Aichi Biodiversity Targets.

FAO'S STRENGTH IN STATISTICS AND OTHER DATA HAS POSITIONED FAO AS A 'CUSTODIAN' OF 21 SDG INDICATORS

The State of the World's Aquatic Genetic Resources for Food and Agriculture (in preparation)

Despite the crucial role of farmed aquatic species and their wild relatives in contributing to global food security and sustainable livelihoods, information available on farmed aquatic genetic resources (AqGR) and their wild relatives is scattered. There are major gaps in reporting aquaculture data at country level and, as a result, to FAO. Furthermore, characterization of aquatic genetic diversity at levels below species level is limited to a relatively small number of species and countries, resulting in poor understanding of the status and trends of AqGR. There is, however, growing recognition that improved information on AqGR will be increasingly important to support sustainable aquaculture and to improve food security and nutrition. An increasing body of information on farmed aquatic, including aquatic plant genetic resources and on genetically distinct fish stocks and cryptic species exists, but more information to underpin sound management is still required. At the same time, many countries lack the capacity and/or the resources to collect information on AqGR diversity.

The State of the World's Aquatic Genetic Resources for Food and Agriculture will be the first global assessment based on national reports on AqGR. The scope of the global report will be farmed aquatic species and their wild relatives within national jurisdictions. When the data from all officially submitted country reports is incorporated, the report will cover more than 90 percent of global aquaculture production in volume and value, respectively. The Commission on Genetic Resources for Food and Agriculture has yet to review the draft report and provide comments and recommendations on the content and the process for its finalization.

Supporting SDG monitoring

The 2030 Agenda was developed ensuring consistency with the CBD's Strategic Plan for Biodiversity 2011-2020 and its Aichi Biodiversity Targets, as well as with other existing international commitments.

A number of the indicators identified as being relevant to the Strategic Plan for Biodiversity 2011–2020, were developed by, or make use of data sets developed for other processes such as those developed by FAO, including its Commission on Genetic Resources for Food and Agriculture.

The example of SDG Target 2.5

FAO maintains the **Domestic Animal Diversity Information System (DAD-IS),** the clearinghouse mechanism for diversity of breeds. It collects data on the proportion of local breeds, classified as at risk, not-at-risk or unknown level of risk of extinction and is required for the monitoring of animal genetic resources status and trends. The resulting 'Status and Trends' reports are made available to the Commission on Genetic Resources for Food and Agriculture at each of its regular sessions and support the Aichi Biodiversity target 13 "trends in genetic diversity of domesticated animal species of major socio-economic importance". In the SDG context, indicator 2.5.1 "number of plant and animal genetic resources for food and agriculture secured in either medium or long term conservation facilities" is being developed by FAO. The proposed animal component of the indicator will be based on counting the number of local breeds stored within a genebank collection with an amount of genetic material sufficient to reconstitute the breed.

FAO also develops new assessment technologies. In partnership with Google Earth and more than 15 partner organizations, involving more than 200 experts and students, a first global dryland assessment on trees, forests and land use, was conducted using the FAO Collect Earth.

Global Livestock Environmental Assessment Model (GLEAM)

This assessment model provides reference assessments of GHG emissions from livestock supply chains. It accounts for all the main livestock species, commodities and sources of emission along supply chains, from land use for feed production to animal production, processing and transportation. Additional modules are currently being developed to expand the scope of GLEAM to other environmental aspects such as nutrients, water and biodiversity.

THE ROME PROMISE on the assessment and monitoring of drylands for their sustainable management and restoration.

FAO, the International Union for Conservation of Nature (IUCN) and the World Resources Institute (WRI) with funding support from the European Union (Member Organization) and the GEF, organized the first Drylands Monitoring week in Rome in January 2015. The meeting titled "Monitoring and assessment of drylands: forests, rangelands, trees and agroagrosilvopastoral systems", was attended by representatives from various countries and international organizations. The event assessed the need and the status of monitoring, and explored tools and new technologies for a comprehensive monitoring of drylands (including forests and agrosilvopastoral systems). The event led to the "Rome Promise on the assessment and monitoring of drylands for their sustainable management and restoration". Participants agreed to: (i) form an open-ended collaborative network or community of practice to advance monitoring and assessment of drylands, including understanding of their users; (ii) communicate the value and importance of drylands monitoring to relevant stakeholders, including policy makers and resource partners; and (iii) develop a dynamic roadmap for collaborative action. A follow up event "Drylands and Forest & Landscape Restoration Week" took place in April 2016 and reviewed progress of the implementation of the Rome Promise road map. This led to the preparation of the first global drylands assessment resulting in the report: "Trees, Forests and Land use in drylands: The First Global Assessment – Preliminary findings" in July 2016.

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The biodiversity module uses the detailed modelling of global livestock production to quantify its contribution to the two main drivers of biodiversity loss – land use and climate change. In order to translate this contribution into impacts on wild species, internationally recognized methods have been adapted to the context of livestock production. The module is in the finalization phase and will provide a first assessment of the global impact of livestock on biodiversity. Integration within the GLEAM framework will also allow assessing environmental performance on multiple criteria, revealing possible trade-offs and avoiding, for instance, the adoption of GHG mitigation options that could be harmful to biodiversity. It will also support the assessment of scenarios in the livestock sector to increase productivity while mitigating impact on climate and biodiversity.

ACTION ON THE GROUND – COUNTRY EXAMPLES FROM DIFFERENT SECTORS

FAO supports capacity development at country and regional level to prepare, implement, monitor and evaluate evidence-based policies, investments and programmes and improve the uptake of knowledge, technologies and good practices. It facilitates partnerships for food security and nutrition, agriculture and rural development, between governments, development partners, civil society and the private sector.

FAO supports numerous farmer field school (FFS) projects, which encourage participatory learning to better understand agro-ecosystem relations, inform decision-making by farmers, and enhance ecosystem services. The FFS approach was conceived in a regional FAO project in Asia in the late 1980s, focusing initially on integrated pest management in rice. Hands-on field-based learning allowed farmers to understand the importance of natural biological control and conserving and enhancing populations of natural enemies to better regulate rice pests. Since then, the FFS approach has been introduced into other regions, integrating a wide range of topics.

The FFS approach is now used in more than 90 countries, supporting rural communities to better understand and manage agroecosystems and enhance ecosystem services.

FAO is also partnering with Bioversity International and the Global Environment Facility (GEF) to twin FFS with Diversity Field Fora in African countries such as Niger. This FFS strengthens the resilience of smallholder farmers, through improved crop and variety diversity, based on local knowledge and farmer-led research and experimentation of most appropriate and resilient varieties to deal with biotic and abiotic stresses in the context of climate change. The approach will be scaled up in 2017–2022 through the Integrated Approach Pilot Programme on Resilient and Sustainable Food Security in Africa (IAP) targeting 12 African countries (US$110 million) partnering with the GEF, the International Fund for Agricultural Development (IFAD) and UN sister agencies.

Currently, FAO supports more than 200 projects, with almost US$500 million on biodiversity, ecosystem, genetic resources, conservation or restoration, among which about 50 projects with GEF.

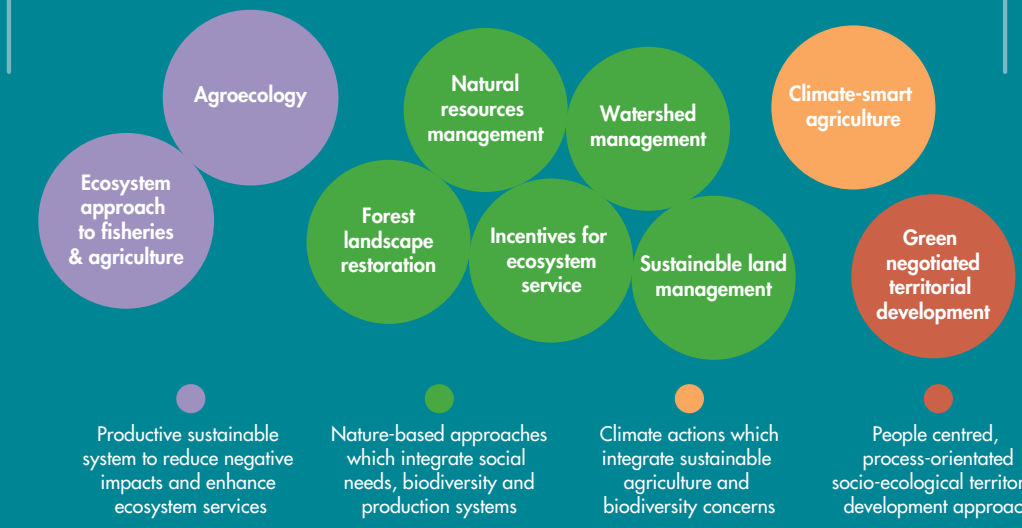
ECUADOR

Sustainable Management of Natural Resources in Chimborazo

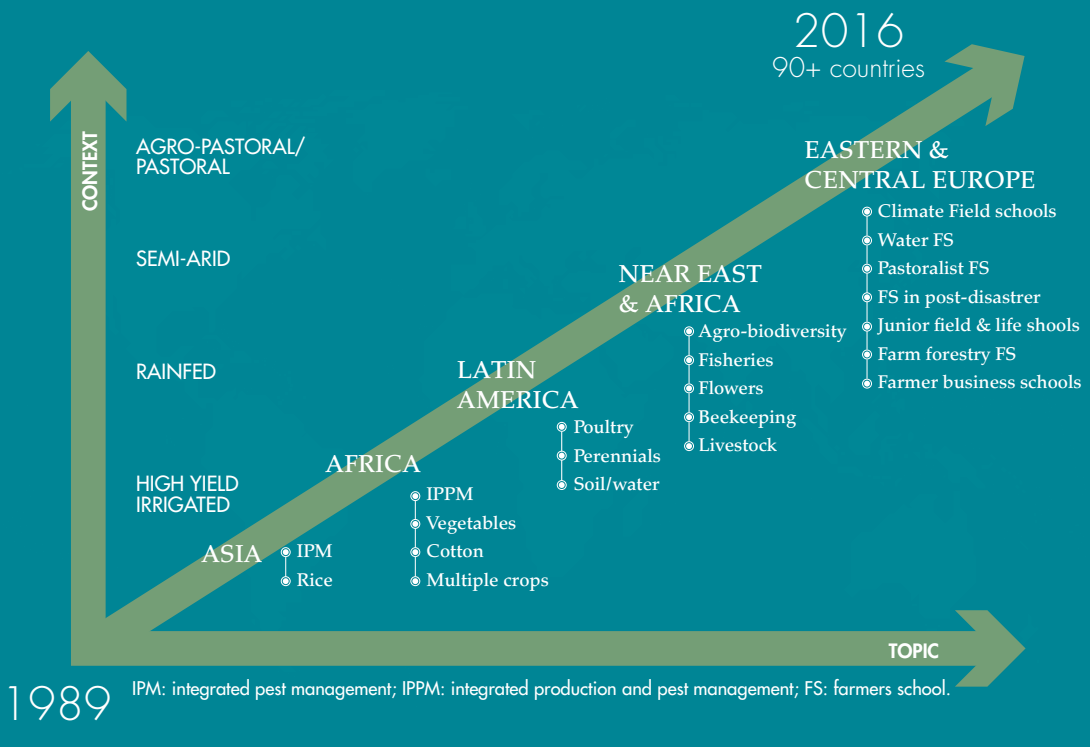
Paramo is a neo-tropical ecosystem characterized by rich, sponge-like soils and vegetation that capture and retain water, acting as a buffer against floods and droughts. This endemic ecosystem serves as a critical provider of environmental services, supplying water for irrigation, human consumption, and hydropower energy to the lowlands' population. The province of Chimborazo

DIFFERENT ENTRY POINTS – SIMILAR CONCLUSIONS

Integrated landscape management for ecosystem service and biodiversity



EXPANSION OF THE FARMER FIELD SCHOOL APPROACH



IPM: integrated pest management; IPPM: integrated production and pest management; FS: farmers school.

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contains 30 percent of the total of Ecuadorian paramo, and has the highest poverty in the country. Farmers have been forced to expand their crop and pasture areas and extend to higher altitudes at the expense of the paramo, with the consequent loss of habitats and biodiversity, soil erosion, reduced water flows, unsustainable water use practices and inadequate management of natural resources.

To reduce these threats, FAO is cooperating with the Ministry of Environment and the Provincial Government of Chimborazo, to preserve and provide sustainable management of the paramo and the biodiversity of mountain ecosystems. Modern watershed management approaches are applied over five sub-watersheds within the Chambo and Chanchán river basins covering about 114 400 ha. A community-based watershed management planning scheme has been established to prioritize conservation and sustainable production projects involving more than 100 communities. After three years of project implementation, 25 220 of the planned 58 000 hectares of paramo are conserved and sustainably managed. The GEF-funded project has set the basis for future work through the design of a compensation mechanism for environmental services in one watershed.

CAMEROON

Sustainable community-based management of mangrove ecosystems

Mangrove ecosystems extend over 30 percent of Cameroon's coastline. Their area has been reduced by one-third in the past 25 years due to development pressures and unsustainable management practices. Mangroves are of high environmental importance. They serve as a carbon reservoir, fishery breeding grounds and natural coastal barrier against storms and tidal waves. They also constitute a major resource for local livelihoods and regional development and the globally important biodiversity that they contain.

FAO IS WORKING TO STRENGTHEN THE WEAK INSTITUTIONAL AND LEGAL FRAMEWORK FOR MANGROVE CONSERVATION AND MANAGEMENT

FAO, in cooperation with the Cameroonian Ministry of Environment and Nature Protection and other partners, is working to strengthen the weak institutional and legal framework for mangrove conservation and management, and to combat the unrestricted and unsustainable harvesting of mangrove resources. The approach works with local communities, creating protected reserves and promoting the development of sustainable mangrove management plans at field level, including improved techniques for the extraction of fuelwood, wooden poles, sand (as construction material), fish and bivalves.

BRAZIL

Integrated management of the Ilha Grande Bay ecosystem

The Ilha Grande Bay ecosystem, south of Rio de Janeiro, consists of a semi-enclosed coastal embayment characterized by Atlantic Forest (Mata Atlântica) and a rich biodiversity both on land and at sea.

Despite its globally significant biodiversity, continued economic growth and the absence of sound planning and efficiency in the application of existing management tools are contributing to a growing number of threats affecting the ecosystem and its associated functions and processes.

CAMBODIA
A flooded forest fishing village in the Tonle Sap area.
©FAO

This FAO–GEF project aims at the long-term conservation and sustainable use of the ecosystems and their associated terrestrial and marine biodiversity. This will be achieved through an Integrated Ecosystem Approach and over a long period through a multiple-phase approach. During the first phase the project has set the basis for future work to prepare:

- a pilot integrated ecosystem management approach to the bay;
- a biodiversity conservation mosaic management and action plan designed to promote greater coordination and coherence among the bay's existing conservation units;
- mitigation of selected threats affecting the "health" of the ecosystem and its ability to provide critical environmental "goods and services" including the conservation of biodiversity;
- increased public awareness and support for efforts to conserve the ecosystem;
- increased institutional capacity in regulatory agencies responsible for environmental policy and management at the state and municipal levels.

INDONESIA

Mainstreaming biodiversity conservation and sustainable use into inland fisheries practices in freshwater ecosystems of high conservation value

The project objective is to strengthen the management framework for sustainable use of inland aquatic biodiversity to increase the protection of high conservation-value freshwater ecosystems and their biodiversity in Indonesia. This is expected to increase the provision of ecosystem goods and services and enhance food security for local people dependent on inland fisheries for their livelihoods. The project, funded through the GEF, aims to combine mainstreaming of inland aquatic biodiversity into resource development and management policy, with demonstrations of conservation and sustainable use of inland aquatic biodiversity in critical habitats at five sites in Kalimantan, Java and Sumatra, and effective monitoring and assessment.

PAPUA NEW GUINEA

Biodiversity monitoring tools for REDD+

The Mountain Partnership Secretariat/FAO, in collaboration with the University of Queensland and Sapienza

FAO'S FIELDS OF WORK

University of Rome, is working with Papua New Guinea's Forest Authority to fully integrate a biodiversity component within its first multipurpose national forest inventory developed under the arrangements for Reducing Emissions from Deforestation and forest Degradation (REDD)+ in the framework of the Climate Change Convention (UNFCCC).

The process involves the identification of an appropriate scientific methodology to assess forest biodiversity at national scale, training staff on the implementation of the biodiversity survey, and support in the analysis of data. The inventory will become a key component of Papua New Guinea's first forest monitoring system. It will include activities for measuring timber volume and estimating carbon stocks and GHG emissions as well as a survey of the nation's forest biodiversity.

The combined inventory will allow the assessment of trade-offs between protecting biodiversity and reducing emissions. Reducing risks to high biodiversity forest ecosystems will increase their resilience and improve their capacity to provide goods and services.

The data produced will also support the development of sound government policies to sustainably manage national biodiversity, with additional benefits for livelihoods and food security.

The initiative is financed by Italian Development Cooperation.

ECUADOR

Mainstreaming the use and conservation of agrobiodiversity in Andean highlands

Ecuador's biodiversity includes a rich agrobiodiversity, which is key, not only to food security and to economic development, but also to the maintenance of ecosystem services such as soil fertility, pollination and disease control. This diversity is endangered due to a lack of synergies between conservation strategies and the use of agrobiodiversity in farming systems, as well as insufficient inclusion of agrobiodiversity in policy frameworks.

In addressing such challenges, FAO, the Ecuadorian Ministry of Agriculture and other partners, are working to integrate the conservation and sustainable use of agrobiodiversity (*ex situ* and *in situ*) in policies, farming systems, and education and awareness. More than 3 000 farmers and indigenous organizations have incorporated native agrobiodiversity in their agricultural systems and the exchange of genetic materials between the National Germplasm Banks and farmers has been strengthened. At the political level, national policies and local development plans have started to integrate measures for the conservation and sustainable use of agrobiodiversity.

REPUBLIC OF MOLDOVA

Support for adaptation and implementation of integrated pest management

With the support of the Government of the Republic of Moldova, the project addresses the degradation of agricultural lands by unsustainable farming practices, serious damage of pests and diseases to crop yield and the impact of droughts on agricultural production and food security. Ecosystem-based solutions were needed, as the government was no longer in the position to financially support the agricultural sector to the same extent as it did during the former Soviet period.

FAO is working with local communities and governments to provide farmers with viable alternatives to manage pests and the agroecosystems in more sustainable ways. Through FFS and training of trainers, the project has promoted integrated pest management and conservation agricultural practices, aiming at creating ecological conditions that suppress the development of pests while also managing fields, vegetable and greenhouse crops.

NEPAL
Terraced landscape.
©FAO/I. Hoffmann

APPROPRIATE SCIENTIFIC METHODOLOGY TO ASSESS FOREST BIODIVERSITY AT NATIONAL SCALE

Empowering farmers in the more efficient use of the ecosystem and the natural resources, including the scarce water resources, is expected to considerably improve ecosystem health, reinforce the ability to provide ecosystem services and reduce soil erosion, combat land degradation, and provide efficient control of pests and diseases.

MULTICOUNTRY

Ensuring the health of the Canary Current Large Marine Ecosystem (CCLME)

This ecosystem is one of the most productive upwelling systems in the world. Cabo Verde, the Gambia, Guinea, Guinea-Bissau, Mauritania, Morocco and Senegal, together with national, subregional and international partners, have developed a common vision to reverse degradation caused by overfishing, habitat modification and changes in water quality, by adopting an ecosystem approach.

In this context, the FAO and UNEP-led project "Protection of the Canary Current Large Marine Ecosystem" has supported countries in the development of a Transboundary Diagnostic Analysis and a Strategic Action Programme – which has already been signed by 11 Ministers (Fisheries and/or Environment) – a unique approach to strategically address a combination of fisheries and environmental governance frameworks. Through

FAO'S FIELDS OF WORK

governance reforms, investments and management programmes, it will enable the participating countries to address priority transboundary concerns on declining fisheries, reduction in biodiversity and deterioration of water quality. It will promote cooperation between the partners of the project and monitor the state of the ecosystem.

The countries of the CCLME have unanimously agreed to work collaboratively to address the following three key transboundary issues:

- decline of living marine resources;
- degradation of habitats;
- deterioration of water quality.

MULTICOUNTRY

Agrobiodiversity benefits from crop and livestock integration in the Kagera basin

FAO has been assisting smallholder farmers and service providers of Burundi, Rwanda, Uganda and part of the United Republic of Tanzania in testing and adapting integrated systems that sustainably increase production, enhance the delivery of ecosystem services and contribute to both environmental and development goals. The GEF-financed Transboundary Agro-ecosystem Management project in the Kagera River Basin has tackled various challenges, including lack of knowledge/capacity and inadequate demonstrative activities, showing how yield, income, nutrition and food security can be increased by increasing agro-ecosystem diversification, agrobiodiversity and resilience.

In addressing such challenges, the Burundi project activities held in the Province of Mwaro are a good example of how watershed level FFS integration has valorized and contributed to the preservation of local agrobiodiversity. A collaborative network has been established between farmers and livestock keepers trained on improved production techniques, to reduce impact on biodiversity and obtain better benefits from ecosystem services. Crop–livestock integration systems, for example, were established through better feeding of animals that led to an increase in manure production (from 3.2 to 11.8 tonnes per year by adult head of cattle). The manure was used to improve soil fertility, pursue agro-ecological intensification and increased agricultural productivity. Furthermore, the introduction of locally adapted forage crops helped to restore protective vegetation and control erosion, rehabilitating the landscape and improving biodiversity while enhancing livestock nutrition and productivity. In addition,

MOUNTAIN AREAS HOST A VAST RANGE OF ECOSYSTEMS AND HIGHLY DISTINCTIVE GENETIC RESOURCES THAT HAVE HIGH SOCIAL AND ENVIRONMENTAL VALUE

the small-scale manufacture of multinutrient feed blocks generated a source of revenue for farmers, providing a good example of multiple benefits.

MULTICOUNTRY

Mountain quality products to enhance agrobiodiversity

Mountain areas host a vast range of ecosystems and highly distinctive genetic resources that have high social and environmental value and supply mountain-specific products such as fruit, dairy, coffee, honey, herbs, spices and medicinal plants. To improve the livelihoods of mountain peoples and boost local economies, the Mountain Partnership Secretariat/FAO, in collaboration with Slow Food International, is promoting a voluntary labelling scheme for mountain products based on their agrobiodiversity.

The Mountain Partnership Products Initiative focuses on the improvement of the value chain of selected products, developing producers' capacities and promoting the conservation and sustainable use of biodiversity and natural resources in mountain areas.

Products in the first phase include native apricots grown in the remote mountainous region of Batken in Kyrgyzstan and rare native black amaranth grain produced in the Bolivian Andes. Other goods ranging from coffee to teas and spices from different mountain areas will also be marketed under the new label, which will be available free of charge to mountain producers following a review of their products and production methods. The initiative is financially supported by Italian Development Cooperation.

MULTICOUNTRY

Forest and Landscape Restoration (FLR) Mechanism

According to the Global Partnership on Forest and Landscape Restoration (GPFLR), more than 2 billion hectares of the world's deforested and degraded landscapes have potential for restoration. FLR plays a crucial role in maintaining biodiversity in agricultural landscapes and restore forests that are among the richest hotpots of biodiversity and source of a number of ecosystem services.

FAO's FLR Mechanism, established in 2014, supports country efforts to improve the resilience, productivity and socio-economic value of forests and landscapes, benefiting human well-being, local livelihoods and the environment. By helping to prevent further forest and land degradation, protecting forest remnants and restoring native vegetation, the FLR Mechanism actively supports biodiversity conservation. Currently active in seven countries (Cambodia, Guatemala, Lebanon, Peru, the Philippines, Rwanda and Uganda), it supports the implementation of national work plans focusing on governance, institutional support and enabling environment, sustainable financing and pilot actions for the implementation of innovative models, potentially replicable in other regions. An additional ten country projects are under development.

COUNTRY CASE

Understanding multidimensional biodiversity webs of interactions from the success of ecological restoration projects in Lebanon

In 2014, the Government of Lebanon initiated the National Afforestation/Reforestation Programme, or "40 million trees programme", an ambitious programme aimed at increasing the forest cover from the current 13 to 20 percent by 2030. The FLR Mechanism supports it by developing and disseminating knowledge on the conditions for successful restoration interventions. In that context, the FLR Mechanism has joined forces with the Forest Ecosystem Restoration Initiative of the CBD to undertake a study aimed at understanding the effects of fencing on sites' biodiversity and ecological succession dynamics, and the role of animal wildlife in the self-sustainability of the restored forests. The study,

FAO'S FIELDS OF WORK

taking place in three different zones in Mount Lebanon, should be a useful benchmark to understand ecological processes and constraints to assisted restoration. Given its novel character, associating different concerned biodiversity partners (Ministry of Agriculture, Saint Joseph University, Jouzour Loubnan (implementing NGO), and FAO), this study will constitute the cornerstone to all subsequent reforestation actions in Lebanon and in the Eastern Mediterranean region.

COUNTRY CASE

From degraded land to a productive ecosystem – a local initiative in Guatemala

FAO and partners are working in Guatemala to restore 1.2 million hectares by 2020. The FLR Mechanism is contributing through forest-based restoration options. It also considers local livelihoods by enhancing crop diversity, food production and the creation of value chains for the rural community. National institutes and authorities are working with FAO on pilot areas to showcase approaches for restoring degraded lands. In one pilot area in South Petén, local agroforestry systems combine local tree species with an understorey of shrubs and crops. A particularly promising system uses the indigenous tree "ramón" together with nitrogen-fixing trees and indigenous and locally adapted species for nutritious foods (e.g. maize, cassava and banana). The system creates a habitat for wild animals, and pollinator populations have recovered – e.g. cassava plants support Melipona bees, bugs and bumblebees. Cultural values form part of sustainable land management in Petén, and agroforestry practices include traditional knowledge. The ramón tree is sacred in the Maya culture and is an important component in maintaining communities' traditions. The restoration work also promotes business initiatives among local producers. A value chain now uses the ramón tree's products. FAO has trained farmers to process these into flour, medicine and cookies. The cookies provide complementary nutrients in school breakfasts. Related women's associations have received support. This local initiative shows how to convert unfertile land into a productive environment for food, while developing a functioning ecosystem, and value chains for local communities.

At regional level, FAO's FLR Mechanism is involved in different processes such as the Initiative 20x20 in Latin America, the African Forest Landscape Restoration Initiative (AFR100), the preparation of a regional strategy and action plan on FLR in Asia–Pacific and the restoration efforts proposed through the Strategic Framework on Mediterranean Forests. These initiatives aim to facilitate the implementation of national commitments by improving: (i) knowledge sharing good practices; (ii) financial resources mobilization; (iii) capacity development; and (iv) FLR monitoring.

At global level, FAO's FLR Mechanism contributes to several initiatives with other GPFLR members: capacity development, sustainable finance and FLR monitoring, e.g. capacity development workshops on ecosystem restoration co-organized with the CBD Secretariat, and development of publications on sustainable financing, organization of the

BANGLADESH
FAO project in the Chittagong Hills to improve livelihoods through sustainable management of natural resources.
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"Drylands & Forest and Landscape Restoration Monitoring Week".

MULTICOUNTRY

Mainstreaming Biodiversity Conservation and Sustainable Use for Improved Human Nutrition and Well-being

Known as Biodiversity for Food and Nutrition, or BFN, the project aims to reverse the declining trend in the availability and use of a large variety of species and to strengthen the conservation and sustainable use of biodiversity for food and nutrition. The project will achieve these objectives by: (i) improving the knowledge base of native wild and cultivated edible biodiversity, including their nutritional content; (ii) using the data to influence policy to protect this diversity; (iii) raising awareness of the importance of conserving and using this diversity to improve diets in the four project countries and beyond; and (iv) enhancing the values chains for specific biodiversity-related foods.

The project is implemented in Brazil, Kenya, Sri Lanka and Turkey and coordinated by Bioversity International, with FAO and UNEP as implementing agencies. National partners of the project are relevant ministries, the scientific community, NGOs, civil society and the local communities.

The BFN will contribute to a better understanding and dissemination of knowledge on these species, which will ultimately enhance their promotion and sustainable use.

Advocacy, awareness events and publications were organized by the countries to inform consumers about the taste and benefit of the underutilized species. The countries have also mainstreamed biodiversity into existing programmes or policies or to develop new ones:

- Kenya developed a Biodiversity Conservation Policy in Busia County.

- Brazil passed Ordinance No. 163 "Brazilian Socio-biodiversity Native Food Species

FAO'S FIELDS OF WORK

of Nutritional Value" – the first time a country has mainstreamed biodiversity for enhanced food and nutrition security.

➧ Turkey is putting standards and a value chain into place for the native Einkorn as well as for several wild vegetables.

MULTICOUNTRY

The EAF-Nansen Project "Supporting the Application of the Ecosystem Approach to Fisheries management considering climate and pollution impacts"

The Ecosystem Approach to Fisheries (EAF), promoted by FAO and funded by Norway, is a holistic strategy for managing capture fisheries that integrates the ecological, socio-economic and institutional dimensions of governance. The EAF promotes an adaptive management process that builds on existing management institutions and practices and includes mechanisms for feedback loops at different time scales to adjust tactical and strategic performance based on past and present observations and experiences.

The new EAF-Nansen Project starting in 2017 will focus on supporting the development and implementation of sound management strategies including provision of the necessary knowledge base, with an added focus on impacts of climate variability and change and other anthropogenic stressors, thus taking into account the increase in breadth required for scientific advice for fisheries management.

MULTICOUNTRY

Expanding Africa's Great Green Wall: Action Against Desertification – Native plant-based solutions for the restoration of drylands and fragile ecosystems

Desertification and land degradation are serious challenges. They lead to biodiversity loss, hunger and poverty, driving unemployment, forced migration and conflict, while amplifying climate risks such as droughts and floods and reduce the adaptation capacity of local communities to climate change. However, recent successes show that these challenges are not insurmountable. Bold action and investments in sustainable land management and restoration can boost food security, improve livelihoods and help people adapt to climate change and mitigate its effects.

Action Against Desertification (AAD) is an initiative in eight countries of the African, Caribbean and Pacific Group of States, launched in August 2014 in support of the implementation of the Great Green Wall for the Sahara and the Sahel initiative and UN Convention to Combat Desertification national action plans. The initiative focuses on restoring degraded lands in drylands and fragile ecosystems using plant-based solutions and putting communities at the heart of the action in Burkina Faso, Ethiopia, Fiji, the Gambia, Haiti, Niger, Nigeria and Senegal, regenerating their productivity for sustainable livelihoods of rural communities. Restoration looks at the whole value chain from seed to end products. The programme is implemented by FAO with partners and is co-funded by the European Union (Member Organization). The approach is based on a five-step model:

➧ **Communities:** focusing on their needs for plant species and restoration objectives through in-depth consultation. This is a critical step for their buy-in, ownership of interventions and the success of the operations.

➧ **Research:** make quality seeds available for propagation of economically viable, locally adapted and biodiverse material. AAD works with forest seed centres, research institutions and universities in each country.

➧ **Operational procedures:** ensure efficient operational restoration processes are implemented on the ground. These include land preparation and management – including water harvesting techniques, which

HONDURAS
Cattle grazing in Lempira.
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BOLD ACTION AND INVESTMENTS IN SUSTAINABLE LAND MANAGEMENT AND RESTORATION CAN BOOST FOOD SECURITY

combine traditional manual and mechanized approaches, direct sowing and assisted natural regeneration when possible, and planting when required.

- **Monitoring:** evaluate the field performance of species, as well as communal activities, such as the maintenance and management of the restored areas;

- **Capacity development:** develop the capacities of village technicians in species identification, seed collection and nursery techniques, planting, management and maintenance of restored areas, development of community-based enterprises using non-wood forest products.

Key elements of the approach include planting the right species in the right place; promoting the use of quality native forest and fodder species for restoration; ensuring that a wide range of useful plant species are used and made available for use; managing natural regeneration of species and planted areas; updating a species database for gene pool traceability, monitoring, reporting and for future data and information use.

THE WAY FORWARD – BUILDING ON GLOBAL MOMENTUM

Policies governing the agricultural sectors, the use of natural resources, protection and conservation of endangered species, habitats and biodiversity need to be aligned to better protect the environment and reduce the ecological footprint of agriculture, forestry and fisheries.

Many organizations and initiatives have lately taken up the cause of sustainable food and agriculture. International frameworks exist for the fisheries and forestry sectors, which interact more directly with and, ultimately, depend on wild biodiversity. However, an international framework for sustainable crop and livestock production is still missing. In addition, in many parts of the world these sectors are still a long way from the transformative changes needed to make them sustainable, and thus secure world food security and nutrition on a long-term basis.

Approaches integrating interactions, synergies and trade-offs between agricultural sectors and the conservation of natural resources exist, however, in order to achieve the Sustainable Development Goals (SDGs), we will need a common strategy to achieve them.

The UN Biodiversity Conference, held in December 2016 in Cancun, Mexico, resulted in significant commitments for action on biodiversity to contribute to the achievement of the SDGs. Through the Cancun Declaration on Mainstreaming the Conservation and Sustainable Use of Biodiversity for Well-Being, ministers and other heads of delegation have committed to work at all levels within their governments and across all sectors to mainstream biodiversity through multiple actions.

The CBD, in its COP Decision XIII/3, requested that further guidance be prepared, in collaboration with FAO, on the concept of "sustainability" in food and agriculture with regard to biodiversity. It welcomed the Biodiversity Mainstreaming Platform launched by FAO to build bridges between sectors, identify synergies, align goals and develop integrated cross-sectoral approaches to mainstream biodiversity in the agriculture, forestry and fisheries sectors.

The 40th Session of FAO Conference welcomed FAO's initiative to act as Biodiversity Mainstreaming Platform and requested FAO to facilitate, in collaboration with its partners, such as the CBD and other UN organizations, the integration in a structured and coherent manner of actions for the conservation, sustainable use, management and restoration of biological diversity across agricultural sectors at national, regional and international levels.

Countries need to commit to concrete and measureable, transformative steps towards sustainable crop and livestock agriculture, and fisheries and forestry management practices. These practices should support biodiversity conservation and increase the productivity, stability and resilience of production systems in an

RWANDA
Members of the Indashyikirwa group having a formal meeting.
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FAO STANDS READY TO PROVIDE A NEUTRAL PLATFORM FOR GOVERNMENTS, COMMUNITIES OF PRACTICE AND OTHER STAKEHOLDERS

integrated landscape/seascape approach, reducing pressure on natural habitats.

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. This will also require better coordination among the different agricultural sectors as none of the sectors will successfully address biodiversity conservation in isolation.

Addressing particularly SDGs 2, 14 and 15, the Platform will also facilitate 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. It will also facilitate the exchange of expertise to improve the design and coordination of relevant policies from local to international levels. Through FAO, the Platform will also serve as a mechanisms to assist in translating the richness and variety of forms of knowledge into policy-related actionable recommendations for consideration by FAO's Technical Committees, fostering the consideration of cross-sectoral linkages between Committees, and Governing and Statutory Bodies. Close linkages will be maintained with the CBD's programme on biodiversity mainstreaming, including in the development of the Post-2020 global biodiversity framework.

RELEVANT PUBLICATIONS AND USEFUL LINKS

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SUSTAINABLE AGRICULTURE FOR BIODIVERSITY

BIODIVERSITY FOR SUSTAINABLE 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 the 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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