



GB0-5 Agriculture Highlights



Convention on
Biological Diversity

Global Biodiversity Outlook 5



The Global Biodiversity Outlook (GBO) is the flagship publication of the Convention on Biological Diversity (CBD). It is a periodic report that summarizes the latest data on the status and trends of biodiversity and draws conclusions relevant to the further implementation of the Convention. The fifth edition of the Global Biodiversity Outlook (GBO-5) provides a final assessment of progress towards the Aichi Biodiversity Targets. The outlook draws on lessons learned over the past two decades to help guide the development of the post-2020 global biodiversity framework.

This document highlights the main findings of GBO-5 with respect to agricultural biodiversity. While nearly all of the Aichi Targets are relevant in some way to agricultural biodiversity, there are some specific elements of the Aichi Targets that are especially relevant to achieving healthy, productive and sustainable agricultural systems.

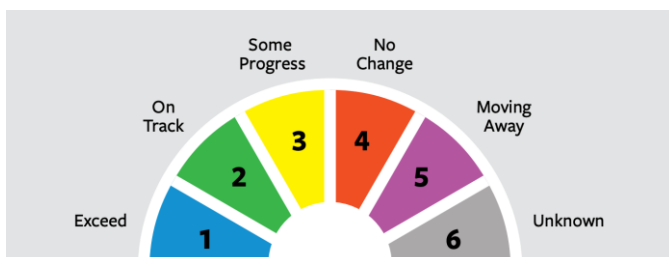
Aichi Biodiversity Targets

In 2010, the Conference of the Parties (COP) to the CBD adopted the Strategic Plan for Biodiversity 2011-2020, which includes 20 Aichi Biodiversity Targets. These global targets were adopted with a deadline of 2020 and focus on different actions and outcomes needed to put the world on a path to achieve the 2050 Vision for Biodiversity:

By 2050, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people



20 Aichi Biodiversity Targets were adopted by the CBD Conference of the Parties (COP) in 2010 as part of the Strategic Plan for Biodiversity 2011-2020



GBO-5 provides an assessment of progress towards the elements of all 20 Aichi Biodiversity Targets, based on available information. Progress towards each element of the Aichi Targets is depicted graphically, as shown on the left. Each segment represents an element and the colour represents the progress made.

Aichi Target 3

Incentives reformed



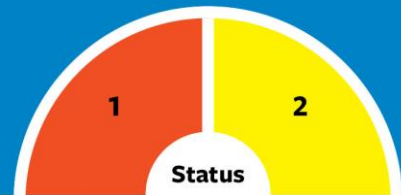
By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.

Summary of Target achievement:

Not achieved (*medium confidence*). Inadequate progress has been made over the past decade in eliminating, phasing out or reforming subsidies and other incentives potentially harmful to biodiversity, and in developing positive incentives for biodiversity conservation and sustainable use.

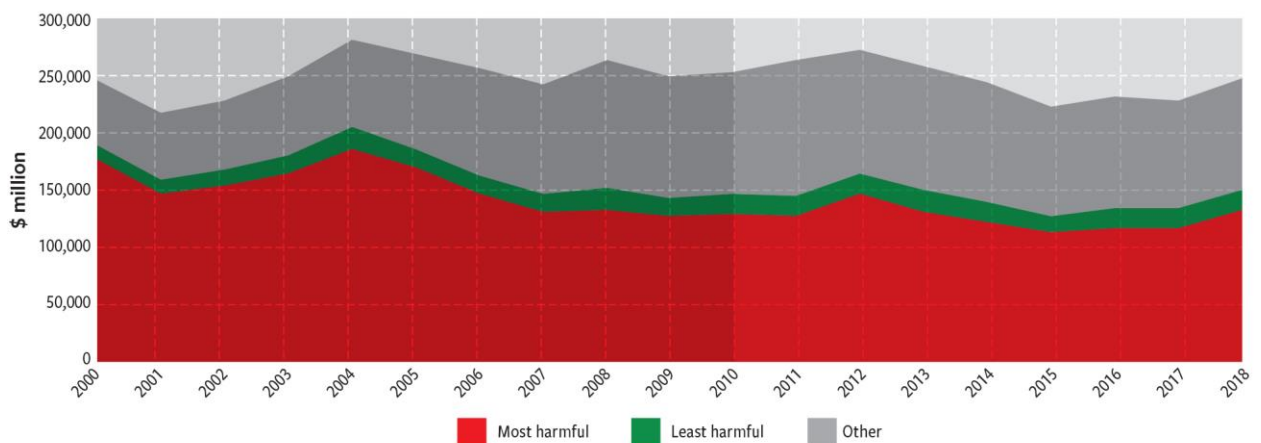
TARGET ELEMENTS

1. Harmful incentives eliminated or reformed
2. Positive incentives applied



- In the past decade, no progress has been made. The value of **elements of government support to agriculture** that are potentially most harmful to the environment (e.g. payments based on commodity output, without imposing environmental constraints on farming practices) remain well above \$100 billion (Figure 3.1).
- Many countries and regional blocs have introduced positive incentives to encourage conservation and sustainable use of biodiversity through **agri-environment schemes**, in which farmers receive payments to implement agricultural techniques that support biodiversity in farmed landscapes.

Figure 3.1. Trends in potentially environmentally harmful elements of government support to agriculture in OECD countries (OECD 2019).



Aichi Target 4

Sustainable consumption and production



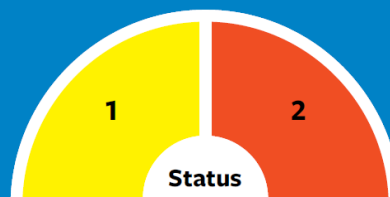
By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.

Summary of Target achievement:

Not achieved (*high confidence*). While an increasing number of governments and businesses are developing plans for more sustainable production and consumption, these are not being implemented on a scale that eliminates the negative impact of unsustainable human activities on biodiversity. While natural resources are being used more efficiently, **the aggregated demand for resources continues to increase**, and therefore the impacts of their use remain well above safe ecological limits.

TARGET ELEMENTS

1. Sustainable production and consumption
2. Use within safe limits



- The number of businesses taking biodiversity into account in their supply chains, reporting processes and activities appears to be increasing (Box 4.2). Through the 10x20x30 Food Loss and Waste Initiative, 10 of the worlds largest food retailers and providers aim to **halve rates of food waste** by 2030.
- A recent analysis shows that global stocks of natural capital declined per person by nearly 40% between 1992 and 2014, compared with a doubling of produced capital and a 13% increase in human capital over the same period. The interim report of an independent review on the economics of biodiversity finds that efficiencies alone cannot lead to sustainable use of natural capital assets, and that long-term sustainability involves confronting difficult questions involving **what and how we consume**, how we **manage our waste**.

Box 4.2. Examples of private sector initiatives and engagement

Unilever: in June 2020 the British-Dutch multinational consumer goods company committed to a range of actions: net zero emissions for all products by 2039; a deforestation-free supply chain by 2023; empowering farmers and smallholders to protect and regenerate their environment with a new Regenerative Agriculture Code for all suppliers; putting in place water stewardship programmes in 100 locations in water-stressed areas by 2030; and investing €1 billion over 10 years in a climate and nature fund.

Aichi Target 7

Sustainable agriculture, aquaculture and forestry



By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.

Summary of Target achievement:

Not achieved (*high confidence*). There has been a substantial expansion of efforts to promote sustainable agriculture, forestry and aquaculture over recent years, including through farmer-led agroecological approaches. Despite such progress, biodiversity continues to decline in landscapes used to produce food and timber; and food and agricultural production remains among the main drivers of global biodiversity loss.

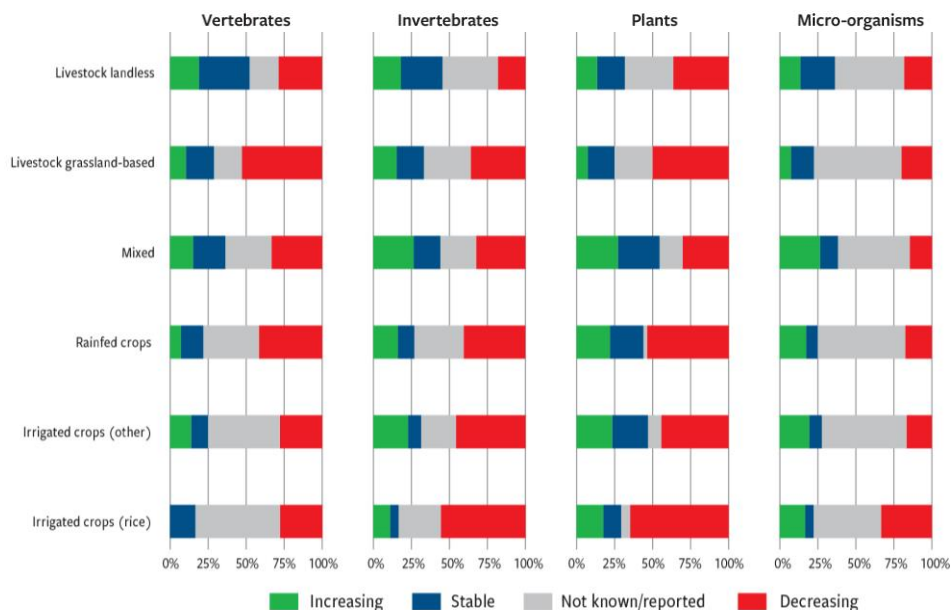
TARGET ELEMENTS

1. Agriculture is sustainable
2. Aquaculture is sustainable
3. Forestry is sustainable



- Overall, **unsustainable monoculture-based agriculture**, with high levels of external inputs, continues to drive biodiversity loss (Figure 7.2) and **total greenhouse gas emissions from agriculture** have grown by some 7% compared to the previous decade.
- Encouragingly, approximately 163 million farms (29% of all worldwide) are practicing some form of **sustainable intensification** on 453 million hectares of agricultural land (9% of the worldwide total). In the last decade, the area of land under **organic agriculture**, and the number of organic producers, both doubled (1.4 million producers and 35 million hectares in 2010; 2.8 million producers and 72 million hectares in 2018).

Figure 7.2. Status in biodiversity associated with different production systems, based on 91 country reports prepared for The State of the World's Biodiversity for Food and Agriculture (FAO, 2019).



Aichi Target 8

Pollution reduced



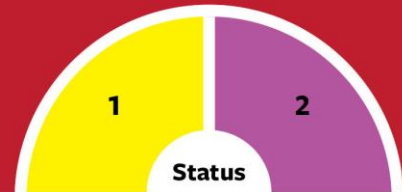
By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.

Summary of Target achievement:

Not achieved (medium confidence). Pollution, including from excess nutrients and pesticides, continues to be a major driver of biodiversity loss. Despite increasing efforts to improve the use of fertilizers, **nutrient levels continue to be detrimental** to ecosystem function and biodiversity.

TARGET ELEMENTS

1. Pollution is not detrimental
2. Excess nutrients are not detrimental



- Following earlier increases, the rate of **nitrogenous and phosphate fertilizer use** per hectare appears to have leveled off in most regions during this decade (Figure 8.1). However, overall emissions of reactive nitrogen, which rose rapidly from the 1950s, continue to increase. While national targets in NBSAPs do address reducing pollution, only a minority address reducing excess nutrients specifically.
- Pollution from **pesticide use** remains at a level that has a detrimental impact on biodiversity. The level of pesticide use varies widely across regions, with the quantity per hectare in Asia and the Americas exceeding the use in Africa more than tenfold (Figure 8.2).

Figure 8.1. Average nitrogen use per area of cropland at regional and global level (FAO, 2020).

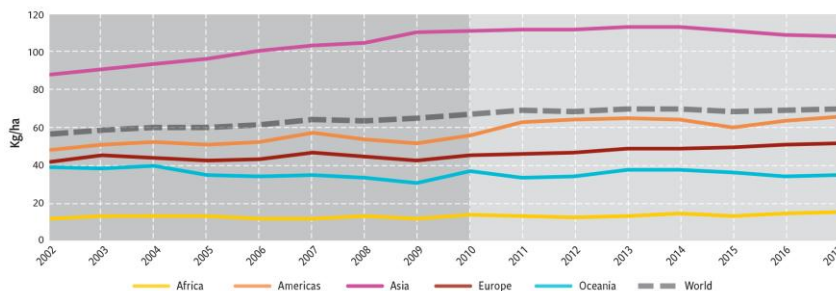
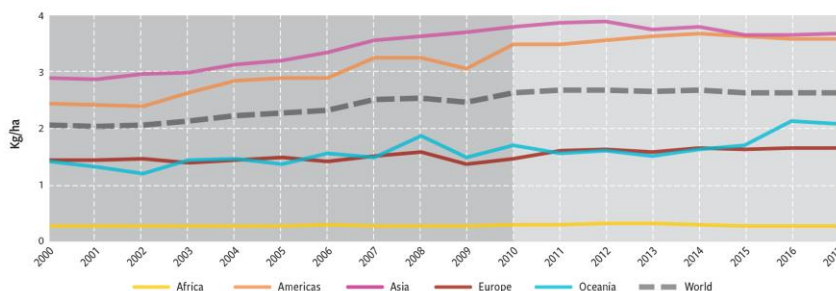


Figure 8.2. Average pesticide use per area of cropland at regional and global level (FAO, 2020).



Aichi Target 13

Safeguarding genetic diversity



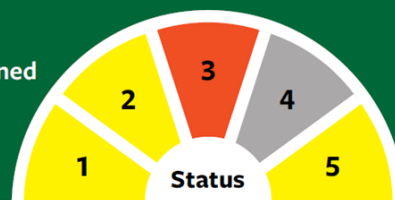
By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.

Summary of Target achievement:

Not achieved (medium confidence). Genetic diversity of cultivated plants, farmed and domesticated animals, and wild relatives, **continues to be eroded**. The wild relatives of important food crops are **poorly represented** in ex situ seed banks that help guarantee their conservation. The proportion of livestock breeds that are at risk or extinct is increasing, although at a slower rate than in earlier years. Wild relatives of farmed birds and mammals are moving **closer to extinction**.

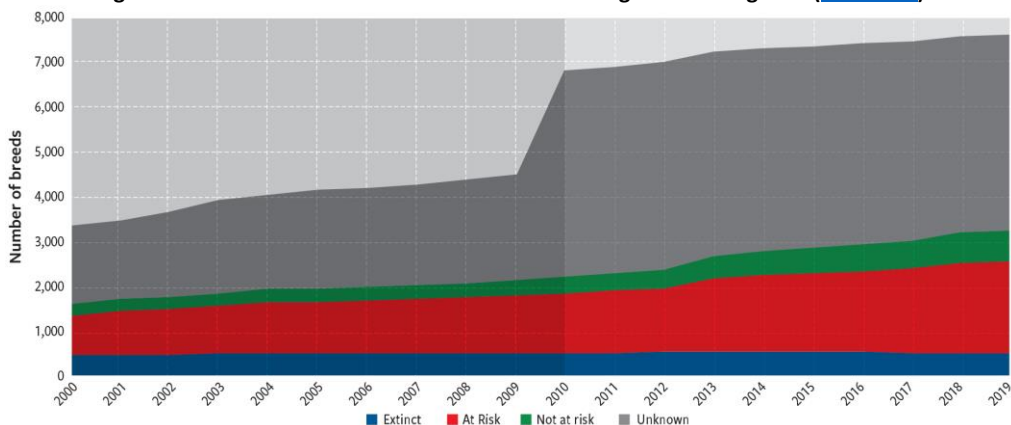
TARGET ELEMENTS

1. Genetic diversity of cultivated plants maintained
2. Genetic diversity of farmed and domesticated animals maintained
3. Genetic diversity of wild relatives maintained
4. Genetic diversity valuable species maintained
5. Strategies to minimizing genetic erosion in place



- An indicator recently developed to assess the conservation status of nearly 7,000 useful wild plant species found that fewer than three per cent were sufficiently conserved either through protected areas (in situ), or in seedbanks or botanic gardens (ex situ). These plants are used, among other purposes, for **plant breeding** (from wild relatives of crops), medicines, materials, **foods**, environmental services such as **shade and erosion control**.
- Out of 7,155 local breeds (i.e. breeds occurring in only one country), **1,940 are considered to be at risk of extinction**. However, for 4,668 of them, the risk status remains unknown due to a lack of data or updated data (Figure 13.2).
- The extinction risk of wild relatives of domesticated or farmed birds and mammals is increasing. A Red List Index covering 55 wild mammal and 449 wild bird species, related to 30 domesticated mammals and birds that are sources of food, showed a decline of 2% from 1988 to 2016, suggesting that **on average these species are moving closer to extinction**. Fifteen of the wild relatives (seven mammals and eight birds) are currently Critically Endangered, indicating that the status of the wild relatives of farmed animals could deteriorate rapidly unless action is taken to reverse their decline.

Figure 13.2. Trends in status of local breeds according to risk categories (FAO,2020).



As indicated in the figure, the total number of breeds assessed has increased over time.

Aichi Target 14

Ecosystem services



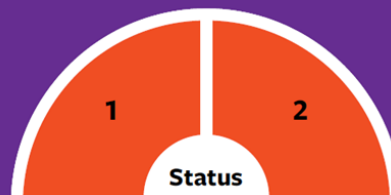
By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.

Summary of Target achievement:

Not achieved (medium confidence). The capacity of ecosystems to provide the essential services on which societies depend continues to decline, and consequently, most ecosystem services (nature's contributions to people) are in decline. In general, poor and vulnerable communities, as well as women, are disproportionately affected by this decline. Mammal and bird species responsible for pollination are on average moving closer to extinction, as are species used for food and medicine.

TARGET ELEMENTS

1. Ecosystems providing essential services restored and safeguarded
2. Actions take into account the needs of women, indigenous and local communities, and the poor and vulnerable



- The continued provision of food, feed, fibre and bio-energy may be compromised by the decline in regulating contributions (Figure 14.1). Poorer groups are most likely to suffer the impacts of declining contributions of nature to people, and are least likely to benefit from increasing contributions such as food production. Loss of forests and native vegetation has affected smallholder subsistence systems by lowering yields, pollination, water provisioning, and access to animals and plants used as food, medicine and fuelwood, as well as aspects of human wellbeing including identity, autonomy, traditional lifestyles and knowledge.
- Pollination by wild species is essential to crops and natural ecosystems. However, according to the IUCN Red List, **16.5% of vertebrate pollinators are threatened with global extinction**, while the Red List Index for vertebrate pollinators is declining, indicating that their extinction risk is increasing. Where national Red List assessments are available, they often show that more than 40% of bee species may be threatened.

Figure 14.1. Global trends, over 50 years, in the capacity of ecosystems to sustain the provision of 18 categories of ecosystem services or Natures' Contributions to People (IPBES, 2019).

Nature's contributions to people		Directional trend			Across regions
		50-year global trend	Decrease	No change	
	1 Habitat creation & maintenance	↓			Consistent
	2 Pollination and dispersal of seeds	↓			Consistent
	3 Regulation of air quality		↘		Variable
	4 Regulation of climate		↘		Variable
	5 Regulation of ocean acidification			→	Variable
	6 Regulation of freshwater quantity		↘		Variable
	7 Regulation of freshwater quality		↘		Consistent
	8 Regulation of soils		↘		Variable
	9 Regulation of hazards & extreme events		↘		Variable
	10 Regulation of organisms	↓	↘		Consistent
	11 Energy		↘	↗	Variable
	12 Food & feed	↓	↘	↗	Variable
	13 Materials & assistance		↘	↗	Variable
	14 Medicinal, biochemical, & genetic resources	↓	↘		Consistent
	15 Learning & inspiration	↓	↘		Consistent
	16 Physical, & psychological experiences		↘		Consistent
	17 Supporting identities		↘		Consistent
	18 Maintenance of options	↓	↘		Consistent

Aichi Target 18

Traditional knowledge



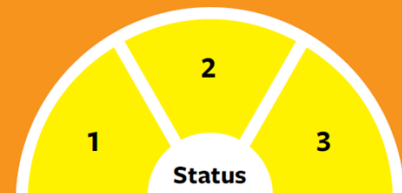
By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.

Summary of Target achievement:

Not achieved (*low confidence*). There has been an **increase in the recognition of the value of traditional knowledge and customary sustainable use**, both in global policy fora and in the scientific community. However, despite progress in some countries, there is limited information indicating that traditional knowledge and customary sustainable use have been widely respected and/or reflected in national legislation related to the implementation of the Convention or on the extent to which indigenous peoples and local communities are effectively participating in associated processes.

TARGET ELEMENTS

1. Traditional knowledge, innovations and practices respected
2. Traditional knowledge, innovations and practices integrated
3. Indigenous peoples and local communities participate effectively



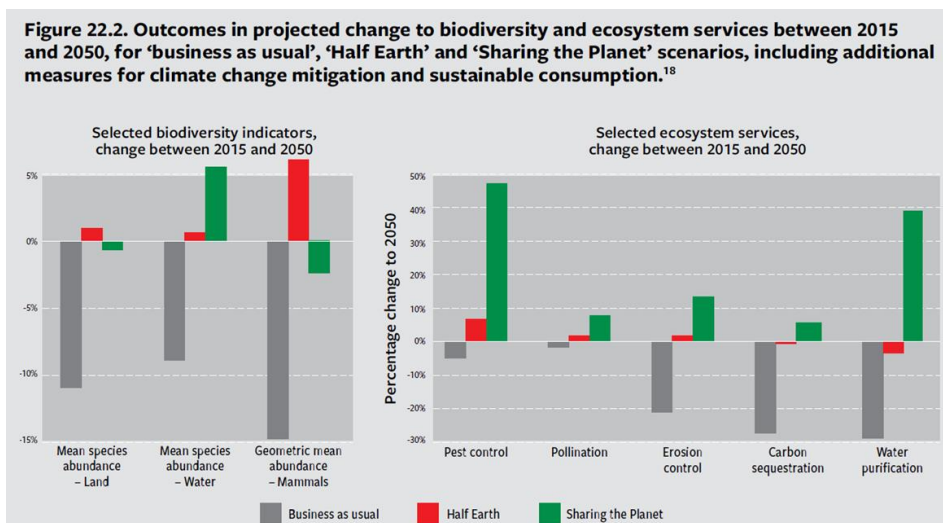
- Numerous examples have demonstrated the ways in which bringing traditional knowledge together with science can lead to **constructive solutions** to various challenges, and lead to the development of policies which are **more tailored to on-the-ground realities**.
- In comparison with the fifth national reports, the sixth national reports show a significant increase in information about the implementation of Aichi Target 18, and the contribution of traditional knowledge and the collective actions of indigenous peoples and local communities to the achievement of other targets, for example through customary sustainable use and traditional agriculture.



Pathways to the 2050 Vision for Biodiversity

Despite the limited progress towards the goals and targets set for the last decade, the 2050 Vision for Biodiversity remains the benchmark guiding global action on biodiversity in the coming years. Multiple lines of evidence suggest that realizing the 2050 Vision for Biodiversity depends on a portfolio of actions in the following areas, each of which is necessary but none on its own sufficient. Each of these areas of action relies on very substantial changes and innovations, involving a wide range of actors at all scales and in all sectors of society.

- Efforts to conserve and restore biodiversity need to be **scaled up at all levels** using approaches that will depend on local context. This includes improvements in the condition of nature across farmed landscapes and seascapes, which provide co-benefits for climate change mitigation.
- **Transformations need to be achieved** in the production of goods and services, especially food. This will include adopting agricultural methods that can meet growing global demand while imposing fewer negative impacts on the environment and biodiversity, and reducing the pressure to convert more land to production;
- Transformations are similarly needed to limit the demand for increased food production by adopting **healthier diets and reducing food waste**.



Alternative, ambitious approaches to conservation can lead to very different outcomes both for biodiversity and for nature's contributions to people. For example, while a focus on protecting intact ecosystems can yield the greatest gains for terrestrial biodiversity, an emphasis on improving biodiversity in 'shared' landscapes such as farmed land generates greater gains for services such as pest control, erosion control and pollination.

Transitions to living in harmony with nature



The Sustainable Agriculture Transition

Summary of the transition: Redesigning agricultural systems through agroecological and other innovative approaches to enhance productivity while minimizing negative impacts on biodiversity. This transition recognizes the role of biodiversity, including pollinators, pest and disease control organisms, soil biodiversity and genetic diversity, as well as diversity in the landscape, for productive and resilient agriculture that makes efficient use of land, water and other resources.

Enhanced biodiversity in agricultural ecosystems would contribute both to the sustainability and to productivity of agriculture. For example, food production is stabilized by diversity among and within crops. The diversity and abundance of pollinators is associated with improved yields and nutritional quality of crops dependent on animal pollination. Biodiversity among crops and livestock, as well as among arthropods and other species in agricultural ecosystems including soil biodiversity, reduces the incidence of pests and diseases. Systems that integrate multiple crops, livestock, fish and trees on farms, can further promote productivity and sustainability through synergistic interactions.

Increasing the productivity and sustainability of agriculture can reduce pressure on forests and other biodiverse ecosystems and, with the appropriate policy measures in place, allow space for increased conservation and restoration activities. It can also improve the resilience of agricultural systems, locally and globally, and contribute to climate change mitigation and adaptation. More sustainable agriculture can also provide habitats for biodiversity,¹⁸ improve connectivity to prevent isolation of species, and support the health and well-being of people through a cleaner, more diverse and resilient rural environment.

Key components of the transition:

- Promote integrated pest and disease management.**
- Enhance management of land and water.**
- Integrate systems of crops, livestock, fish and/or tree production for productivity and ecological benefits.**
- Maintain biodiversity in agricultural ecosystems.**
- Promote on-farm learning and research.**
- Improve connections between farmers and consumers.**
- Provide an enabling environment.**



The Sustainable Food Systems Transition



Summary of the transition: Enabling sustainable and healthy diets with a greater emphasis on a diversity of foods, mostly plantbased, and more moderate consumption of meat and fish, as well as dramatic cuts in the waste involved in food supply and consumption. This transition recognizes the potential nutritional benefits from diverse foods and food systems, and the need to reduce demand-driven pressures globally while ensuring food security in all its dimensions.

The global food system is associated with many drivers of biodiversity loss, in particular through land-use change, the impacts of excess nutrients and the generation of greenhouse gases. At the same time, close to 750 million people suffer severe levels of food insecurity and many more are malnourished. Levels of food insecurity and malnourishment, as well as obesity, are projected to continue to increase if current trends are maintained. Shifting to diets that are healthier and more sustainable could simultaneously help to improve human health, reducing diet-related premature mortality by over 90%, and reduce and help reverse the drivers of biodiversity loss.

Healthy diets are underpinned by biodiversity: a diversity of species, varieties and breeds, as well as wild sources (fish, plants, bushmeat, insects and fungi) provide a range of nutrients. Wildlife, from aquatic and terrestrial ecosystems, is a critical source of calories, protein and micronutrients such as iron and zinc for more than a billion people.

Currently, some 30% of food produced is not consumed, either because it does not reach the markets and rots (the predominant cause of losses in developing countries), or because it is not eaten and is thrown away (the predominant cause of losses in developed countries). Reducing food losses and waste would bring substantial benefits with few negative trade-offs.

Key components of the transition:

- Rebalance agricultural policies and incentives.**
- Promote the availability, access and consumption of healthy and sustainable diets.**
- Promote measures to reduce food waste.**
- Encourage businesses to promote sustainability through supply chains and to redesign product portfolios.**

