



# IF BIODIVERSITY IS ALIVE, SO IS THE PLANET

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# If biodiversity is alive, so is the planet

To ensure **good, clean and fair food for all** we need to start from biodiversity and invert a production model that continues to generate environmental and social disasters, undermining the foundations of food security for present and future generations.



For more than 20 years now, Slow Food has worked on the biodiversity that underpins **agriculture and food production**: plant species and varieties, animal breeds, beneficial insects, microorganisms, ecosystems, knowledge and cultures. It was one of the first organizations to focus attention on **domestic biodiversity** (of cultivated varieties and farmed species) and the first anywhere to consider **processing techniques and processed products** (bread, cheese, charcuterie) as an integral part of the biodiversity that needs saving.

Biodiversity enables agricultural systems to resist environmental shocks, climate change and pandemics. It provides essential ecosystem services, such as pollination and soil fertility. It makes it possible to produce food with a lower impact on non-renewable resources (water and soil) and fewer external inputs (fertilizers, pesticides, antibiotics).

## Small-scale biodiversity



### IN THE SOIL

The soil is the world's greatest source of biodiversity and two thirds of all living beings are hidden under its surface. Fertile soil provides the nutrients and water necessary to produce food, filters rainwater and returns it into circulation, clean and drinkable, and stores enormous quantities of carbon.

-  Industrial agriculture impoverishes soil fertility because it is based on monocultures, requiring large amounts of synthetic chemicals and water, and making excessive use of machining.
-  Agroecological practices preserve and regenerate soil fertility by avoiding deep plowing, limiting the use of synthetic chemicals, and adopting rotations (including with leguminous plants) and green manure.


### IN THE SEAS

The entire terrestrial ecosystem is based on plankton: in addition to being the cornerstone of the marine food chain, it's fundamental in carbon dioxide capture, and generates two thirds of the oxygen in the planet's atmosphere (more than forests).

-  The pesticides, nitrates and phosphates present in fertilizers filter into watercourses and flow into the sea, causing the excessive development of some types of phytoplankton (microscopic algae) and upsetting the marine food chain. When these algae die and decompose, they absorb huge quantities of oxygen and generate dead zones on the sea floor.
-  Improving the purification of sewage and wastewater drained into rivers and seas is fundamental. But first of all, it is essential to embrace agroecological practices and drastically reduce the use of synthetic chemicals in agriculture.

## IN FOOD


Fermented food products form the base of the diets of all the world's civilizations. We eat them every day without realizing it: they include bread, cheese, chocolate, charcuterie, yogurt, beer and wine. Fermentation is caused by fungi, yeasts and bacteria that are found in the soil, in pastures and in production environments. Fermentation raises the nutrient content of foods (the vitamin C in sauerkraut, for example, may increase five-fold), enriches them with probiotic microbial flora, and gives them unique sensory characteristics.


 Industry needs standard processes: this is why it tends to erase the biodiversity which underpins fermentation processes, replacing it with selected yeasts and enzymes, thereby homogenizing flavors and breaking ties with local areas. This is now a common practice in the world of wine, beer, cheese and bread.

 To protect microbial biodiversity, Slow Food promotes natural products: hence cheeses without industrial enzymes, naturally-leavened bread, additive- and preservative-free charcuterie, and wines with native yeasts.

## IN THE HUMAN BODY


The microbiota of the human gut is an ecosystem of a trillion cells which plays a decisive role in human health. The microbiota is largely influenced by our genes, but it also depends on our lifestyle and diet. We absorb the bacteria that make up the microbial community in the gut from food, water and contact with the environment, especially with the soil.


 Urbanization limits contact with the natural environment; intensive agricultural practices reduce microbial biodiversity in the soil; the excessive use of antibiotics among humans and animals and excessive consumption of meat and ultra-processed food alters the microbiota.

 To preserve the microbial richness of the gut, it is fundamental to promote the consumption of fermented foods (such as yogurt, kefir, sauerkraut, miso and kimchi), foods rich in fibers, and relatively unprocessed ingredients from farms that maintain or regenerate soil fertility.

## ON FLOWERS

Forty percent of agricultural production depends on pollinators. A great deal of this work is carried out by insects: bees, wasps, butterflies, moths, beetles, ants and so on.



 Pollinators are seriously threatened, with Europe losing a third of its bee and butterfly populations. The main cause of this is the use of pesticides in agriculture, together with monocultures (which reduce biodiversity), overbuilding, climate change and the transport of exotic species.

 The solution is to reintroduce green infrastructure, especially hedges, stable meadows and areas given over to nectariferous plants, and to adopt agroecological practices that don't rely on the use of pesticides.

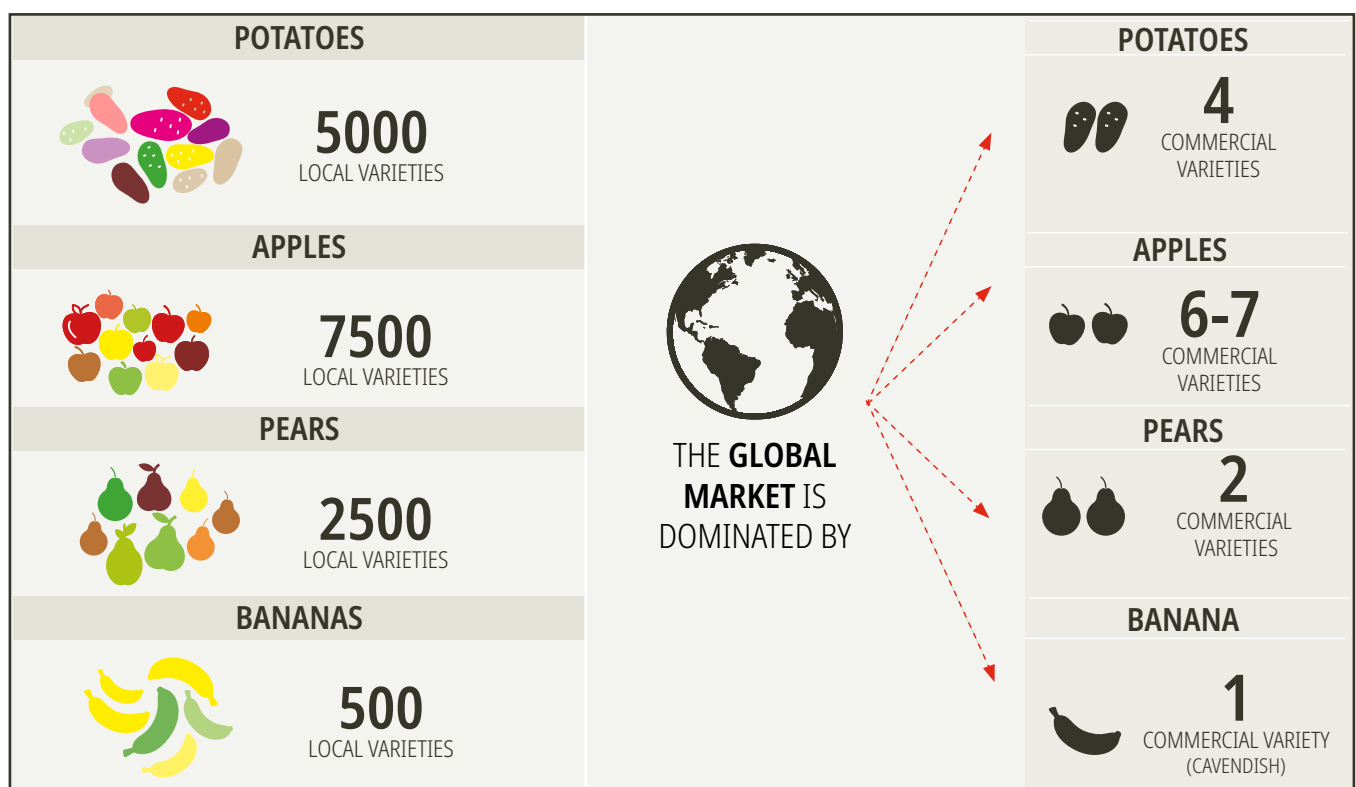


## Cultivated biodiversity

Rural communities have selected, preserved and reproduced seeds over time, thus improving the yield, taste and nutritional value of a large number of vegetables, legumes and cereals.


-  Seventy-five percent of the crop varieties that were grown at the start of the 20th century have now been lost. Since the 1970s, agricultural production has been oriented towards a limited number of varieties. Three species—corn, rice, wheat—supply 60% of the world's food energy. Sixty-three percent of the seed market is made up of commercial hybrids controlled by multinationals; these same multinationals also own GMO patents and are leaders in fertilizer, pesticide and herbicide production.
-  Conserving greater genetic variability is essential for maintaining an agricultural system that can feed the planet by addressing climate change, disease and future shortages of natural resources. The preservation of heirloom varieties and cultivation techniques is also essential for the protection of rural landscapes and the gastronomic heritage of local communities.

### THE DISAPPEARANCE OF PLANT VARIETIES



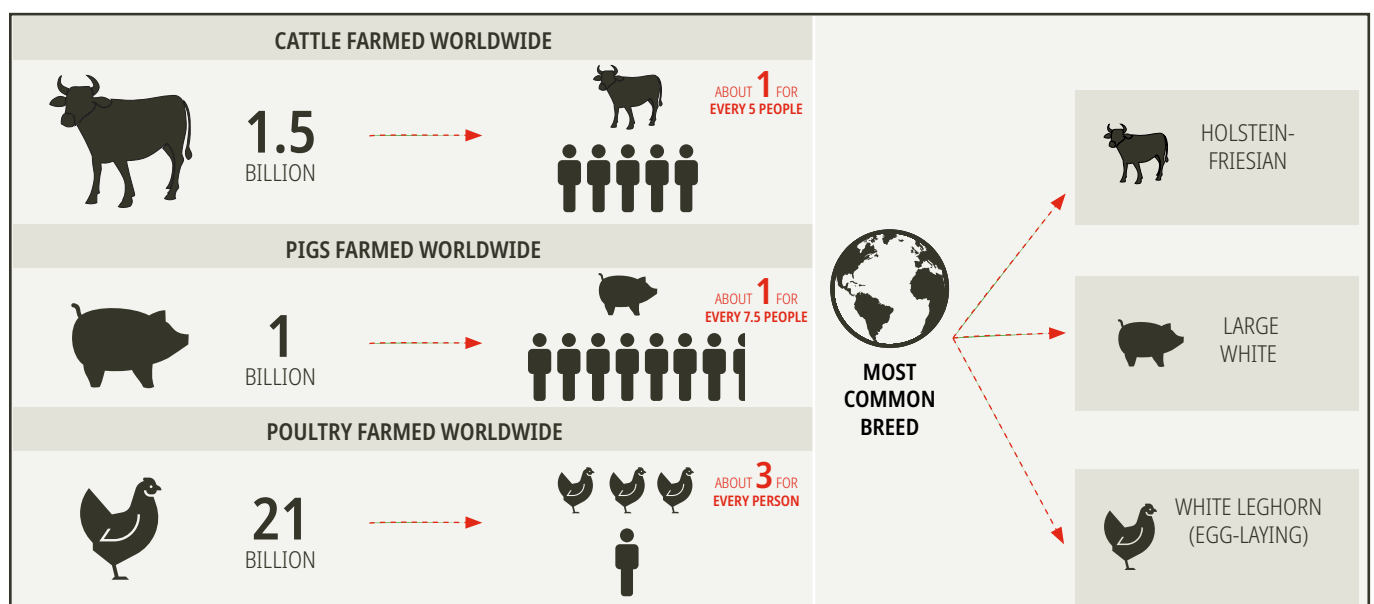
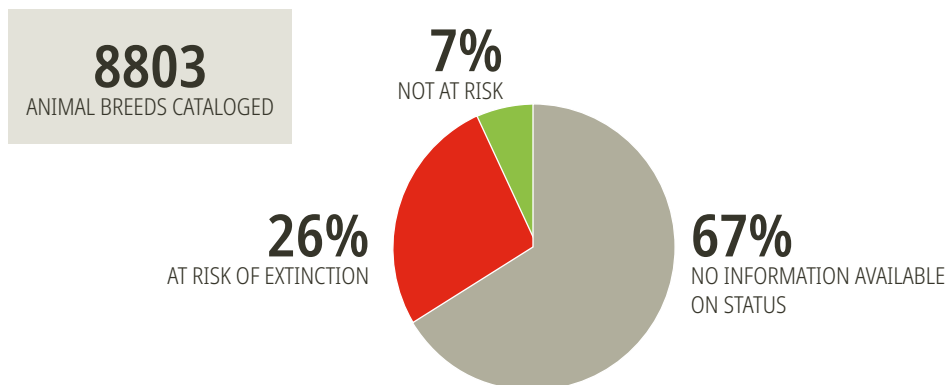
## Farm biodiversity

Rural communities have selected thousands of animal breeds that have adapted to different climates, including hostile, inaccessible habitats (whether they be arid, cold or swampy) and marginal areas. Traditional breeds are more resistant, hardier and more fertile; they also tend to live longer. When raised sustainably in their own habitats they provide high-quality milk and meat for cheese, charcuterie and other by-products—a heritage of gastronomic traditions. In any well-tended pasture, animals stir the soil with their hooves and thus help drainage, rainwater absorption and oxygen diffusion. Small ruminants eliminate shrubs and help reduce the risk of wildfires.

 Twenty-six percent of the 15,000 breeds cataloged across the world are at risk of extinction (with fewer than 1000 head) and the status of 67% of them is unknown. Industry relies on only a few commercial breeds, selected for their milk and/or meat yields; these are intensively farmed without access to open spaces, treated with antibiotics, raised on animal feed and transported over long distances. As a result of this model, the zootechnics sector is responsible for 14.5% of greenhouse gas emissions.

 In order to address the loss of animal biodiversity, it is necessary to support a livestock farming model based on diversity, the capacity of local breeds to adapt, their ties with the local area, and pastures.



### THE DISAPPEARANCE OF ANIMAL BREEDS





## AQUACULTURE

Half the fish consumed in the world come from aquaculture, which is now the most rapidly-growing sector of the food industry.

-  Farmed fish feed on other fish; fishing for the production of fishmeal to feed aquaculture farms is plundering the oceans. Seventy percent of forage-fish gathered (sardines, anchovies, mackerel, herrings and crustaceans) are processed into meal and oil for use in aquaculture.
-  Aquaculture could be a partial solution to the over-exploitation of fish stocks but only if it focuses on herbivorous species and extensive, in situ farming techniques that are integrated with nature, envisaging low fish densities and minimum human intervention.



## Wild biodiversity

### EDIBLE WILD PLANTS

Wild plants may be used for food, cosmetic and medicinal purposes, and are often richer in vitamins, minerals and/or macronutrients (fats and proteins) than the plants that dominate agricultural production.

- 👎 Their biodiversity depends on the health of threatened natural habitats, above all forests. Good management depends on community knowledge, like that of disappearing indigenous populations.
- 👍 Including wild plants in our daily diet is a way of protecting knowledge regarding their gathering and the ecosystems in which they grow: forests, mountains, lagoons and so on.

### FISH


Fish is our main wild source of animal protein. There are 30,000 species of fish and each one of them establishes complex interdependencies with other species in the food chain. Small-scale fishers possess in-depth knowledge of marine ecosystems: they catch diverse species using selective techniques according to the season and allow for suitable rest periods which take the animals' reproductive phases into account.


- 👎 We are now eating more and more fish (average individual consumption increased from 9kg a year in 1961 to 20.5kg in 2018) but always the same species: salmon, tuna, tropical shrimp, cod and little else. Huge radar-equipped factory trawlers are destroying sea beds, while species regarded as second-rate, fished accidentally, are not eaten. Marine biodiversity is threatened by industrial fishing but also by urbanization, pollution and climate change.
- 👍 It is necessary to consider ecosystems in all their complexity, to involve all the actors (institutions, fishers, citizens) and to support sustainable models based on selective forms of fishing, the protection of natural habitats and mindful consumption.



## Biodiversity and knowledge

Traditional agricultural techniques make it possible to grow crops on steep slopes, in dry areas and in extremely harsh climates. In order to conserve their primary ingredients (e.g. milk, meat, fish, cereals, fruit), communities have developed complex processing techniques that today give food products significant added value, and which save plant varieties and animal breeds from extinction. Small variations give rise to thousands of typologies of cheese, bread, charcuterie, oil, preserves and so on.

 Techniques based on knowledge handed down orally are disappearing at a startling rate as the last generations to guard their memory disappear too; few among the younger generation are prepared to gather and perpetuate this traditional knowledge.

 To save knowledge, it is necessary to identify it (with mapping projects involving local communities), restore its value, support those who safeguard its memory, and promote training activities to ensure that it is passed on to the younger generations.

### EXAMPLES OF AGE-OLD FARMING TECHNIQUES



OASIS  
MOROCCO



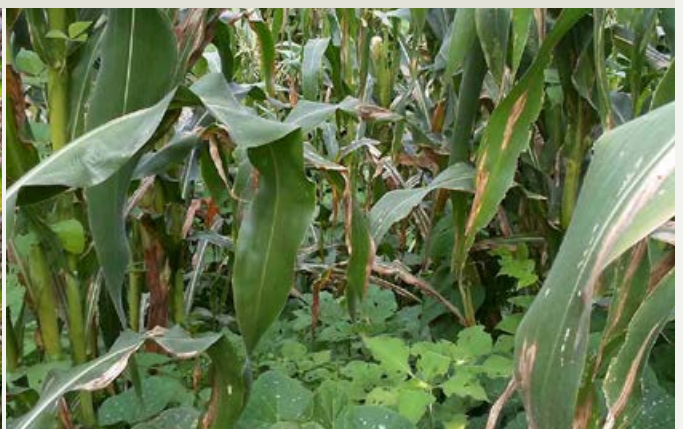
TERRACED VINEYARDS  
ITALY



SUBAK  
INDONESIA





ANDENES  
PERU

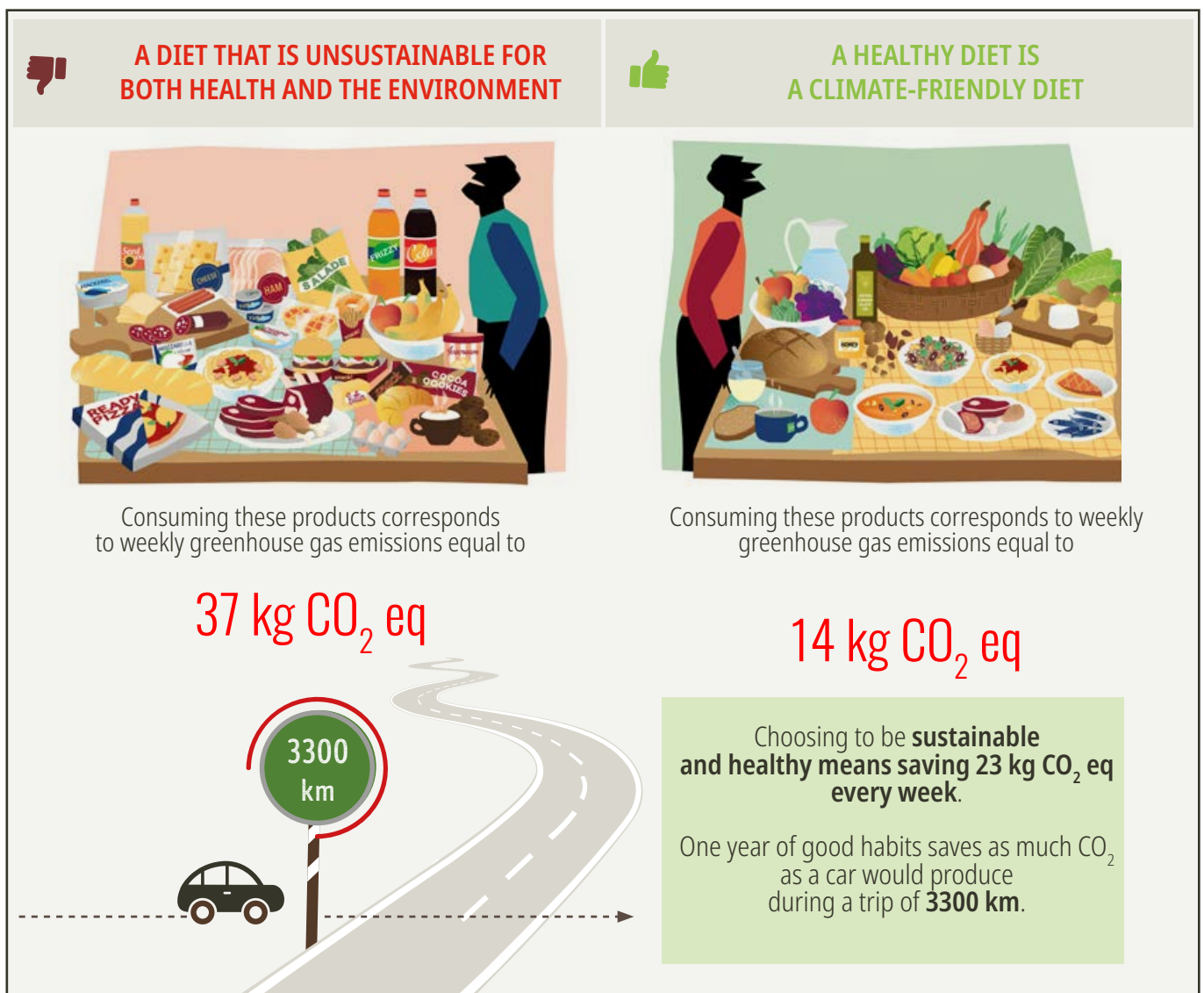


MILPA  
MEXICO

## Biodiversity and diet

Biodiversity contributes to a healthy, diversified diet in a number of ways. Local varieties and breeds and wild species often have a higher nutrient content than corresponding commercial and cultivated versions. The foods and eating styles that are good for human health also have a lower impact on the planet's environment.



-  Malnutrition in all its forms (undernourishment, lack of micronutrients, excess weight and obesity) and the deterioration of environmental resources are closely connected. The production systems responsible for biodiversity loss (intensive agriculture, factory farming, pesticides) also underpin inadequate lifestyles based on overconsumption of animal-origin and ultra-processed foods rich in sugars, fats, salt and preservatives.
-  Consuming more plant-based foods, especially plants cultivated with agroecological practices, and reducing consumption of foods of animal origin helps to prevent cardiovascular disease, diabetes, tumors and all forms of malnutrition while, at the same time, reducing our exploitation of raw materials. Opting for local varieties and breeds and wild species helps improve nutrition and ensure food security.





## Biodiversity and pandemics

Forests and other natural habitats are rich sources of biodiversity; they're essential for the balance of the planet's environment, but they're also fragile.

-  The destruction of natural habitats and the consequent loss of biodiversity creates conditions conducive to the spread of zoonotic diseases and increases the risk of epidemics as a result of spillover (the transmission of viruses from wild to domesticated species and humans). Factory farms increase the risk of the spread of zoonotic diseases exponentially.
-  Curbing human activities like habitat upheaval and deforestation, while protecting biodiversity with sustainable agricultural and livestock farming practices, means protecting humanity from new pandemics.





## Biodiversity and international policies

### EUROPEAN UNION

The **European Green Deal**, aims to transform the EU into a fair and prosperous society, to restore value to natural capital and to protect the health and well-being of citizens from environmental risks; the target being to achieve zero-impact by 2050.

The **From Farm to Fork strategy** promotes transition towards a sustainable agrifood system, emphasizes the role of small-scale agriculture and agroecology, and sets ambitious targets for 2030 with regard to organic agriculture (at least 25% of the agricultural land used in the European Union), pesticides (a 50% reduction), fertilizers (a 30% reduction) and animal welfare. It is fundamental to maintain this level of ambition.

The **Biodiversity 2030** strategy aims to enlarge the network of protected areas, develop a new EU Nature Protection Plan, free up resources, to introduce governance mechanisms to allow transition, and put measures in place that promote biodiversity globally.

The **CAP**, which supports intensive agricultural practices and factory farming, is currently at odds with the Farm to Fork vision and the Biodiversity strategy proposed by the European Commission. It is essential to bring the CAP into line with the Green Deal.

### UNITED NATIONS

The **Convention on Biological Diversity** (1992) is an international treaty for the conservation of biodiversity and the fair and equitable sharing of its benefits.

The **International Treaty on Plant Genetic Resources for Food and Agriculture** (2001) emphasizes the importance of agrobiodiversity for food security and the decisive role of farmers for the conservation of genetic resources.

The **Cartagena Protocol** (2003) aims to protect biological diversity from the potential risks of living organisms modified by modern biotechnologies.

The **Nagoya Protocol** (2014) seeks to share the benefits of the use of genetic resources fairly and equitably. In October 2021, the Convention on Biological Diversity Conference of the Parties (COP) will adopt a new Global Framework for biodiversity post-2020. This will be a key event at the global level.

**To find out more about these issues, check out the full Slow Food position paper on biodiversity.**



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