

Biodiversity in the Food System

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BIODIVERSITY, or biological diversity, is the variety of living things in the world or in a particular ecosystem, including agroecosystems such as farms and fisheries. Within the food system, biodiversity includes all of the plants, animals, and microorganisms at the genetic, species, and landscape levels where our food is procured and produced.¹

AGROBIODIVERSITY is the biodiversity associated with agriculture.

KEY POINTS

1. **Biodiversity** is critical for healthy ecosystems that support life on earth.
2. **Agriculture** is a major driver of biodiversity loss globally.
3. **Agrobiodiversity** supports food security by providing diverse foods and buffering unexpected shocks.
4. **Agrobiodiversity** can be encouraged through practices such as agroforestry, cover crops, intercropping, and managing different types of land use (land-use mosaics).

WHY BIODIVERSITY IN THE FOOD SYSTEM IS IMPORTANT

Biodiversity is crucial for our food supply and supports food security as well as the sustainability and resilience of food systems.^{2,3} Of the approximately 2 million species on earth, 7,000 edible plant species have been cultivated in human history, and approximately 150 plant species are consumed by humans today.^{1,4} Increased agrobiodiversity enhances the ability of farms to provide ecosystem services that support life including pollination, water purification, carbon sequestration, food production, and soil health improvement.

Cultivating a diverse variety of crops and animals on farms helps enhance resilience to shocks such as economic or climate-related events, while also supporting dietary diversity and food security.⁵ Traditional ecological knowledge used by communities around the world may also help to manage and conserve biodiversity, with practices including agroforestry or intercropping.⁶

Agriculture is a major driver of biodiversity loss globally, replacing species-rich ecosystems with monocultures characterized by a single species cultivated for food. Since the 1900s, approximately 75 percent of crop genetic diversity has been lost globally with a transition from cultivating multiple crop varieties for high-yielding and genetically uniform varieties.⁷ While there are over 7,000 edible plant species, our food systems rely on just three crops for more than 50 percent of our plant-derived calories: rice, wheat, and corn.^{1,4}



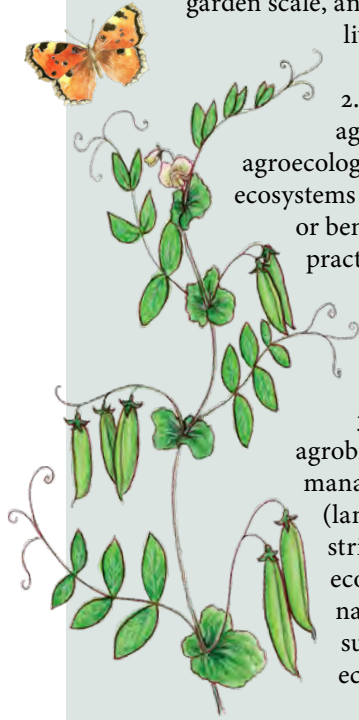
HOW TO MEASURE BIODIVERSITY

At the species level, biodiversity is measured by counting the number of species and the number of individuals within each species (or species abundance) present in a given area, such as on a farm. For large areas or those with high biodiversity, researchers might only measure a part of the area, such as a plot of a predetermined size (ex: 20 feet x 20 feet). The values for

the number and abundance of species are then used to calculate various biodiversity index values such as the Shannon-Wiener Diversity Index and the Simpson's Diversity Index.⁸ Researchers can apply these methods to compare the biodiversity of agroecosystems under different management practices.

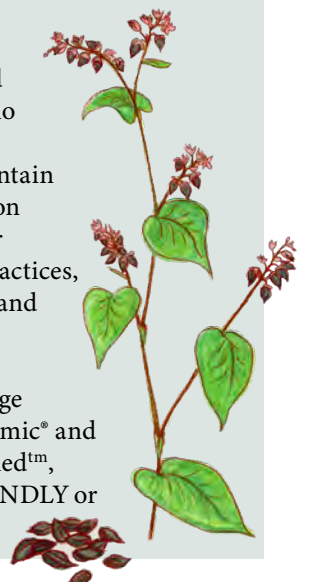
PRACTICES TO SUPPORT AGROBIODIVERSITY

1. **At the genetic and species levels**, agrobiodiversity can be enhanced by cultivating multiple crop landraces, varieties, and species at the farm or garden scale, and by raising multiple breeds of livestock.
2. **At the species level**, agrobiodiversity can be enhanced by agroecological practices that mimic healthy ecosystems and creating habitat for pollinators or beneficial biologic activity through practices such as crop rotations, cover crops, intercropping, pollinator strips, and hedgerows at either the farm or garden scales.
3. **At the landscape level**, agrobiodiversity can be promoted by managing different types of land use (land-use mosaics), use of buffer strips to support healthy aquatic ecosystems, and by connecting natural areas of farms with surrounding ecosystems.



CONSUMER PRACTICES TO SUPPORT BIODIVERSITY IN THE FOOD SYSTEM

1. **Consume a diverse range of foods** from varied sources including wild food environments. This may include locally cultivated and seasonal foods from your local grocery store or market. Or this may include, diverse foods from foraging, fishing, or hunting such as berries and mushrooms, wild caught fish, or wild game.
2. **Support diversified farms through your food choices.** Choose to buy foods sourced from farmers or ranchers who cultivate many varieties of crops and animals, who maintain uncultivated and conservation areas, practice sustainable or regenerative management practices, and who encourage wildlife and pollinator habitat.
3. **Look for labels that encourage biodiversity** such as Biodynamic® and Regenerative Organic Certified™, shade grown, and BEE FRIENDLY or pollinator friendly.



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