

AGROECOLOGY AND BIODIVERSITY





“Biological diversity resources are the pillars upon which we build civilizations.”

At Agroecology Europe, we aim to transform EU farming and food systems into thriving ecosystems characterised by enhanced biodiversity, energy efficiency, and resource conservation, fostering heightened resilience in the face of climate change.

We envision a shift towards agroecology where the emphasis on functional biodiversity and strengthened biological regulation within agroecosystems reduces the current dependency on fossil fuels and harmful substances.

Agroecology integrates ecological principles into agricultural practices to foster sustainable farming, protect biodiversity, enhance ecosystem services, and preserve habitats and landscapes. This approach contrasts sharply with industrial agriculture that has led to significant biodiversity loss and habitat degradation over the past sixty years.

On the occasion of the [International Day for Biological Diversity](#), Agroecology Europe intends to add its contribution with this factsheet and recalls the central role of agriculture and agroecology in preserving biological diversity, whether natural or cultivated.

#BiodiversityDay

#ForNature



Agroecology Europe
#PartOfThePlan
International Day
for Biodiversity
2024



Agroecology: The application of ecological concepts and principles to the design and management of sustainable agricultural and food systems.



Biodiversity: The variety of life in the world or a particular habitat or ecosystem, crucial for resilience and ecosystem health.



Ecosystem services: Benefits provided by ecosystems that contribute to making human life both possible and worth living, such as pollination, pest control, water purification, and climate regulation.

IMPACTS OF INDUSTRIAL AGRICULTURE ON BIODIVERSITY

Biodiversity loss: Industrial agriculture has been a leading cause of biodiversity decline due to habitat destruction, overexploitation, pollution, and introduction of invasive species (Maxwell et al., 2016).

Habitat degradation: Practices such as the removal of hedgerows, drainage of wetlands, and large-scale monocultures have drastically altered landscapes (Stoate et al., 2001, 2009).

Ecosystem disruption: Heavy use of agrochemicals has disrupted soil microbiomes, reduced insect populations (including pollinators), and harmed non-target species (Ndakidemi et al., 2016).

MECHANISMS OF BIODIVERSITY DECLINE IN CONVENTIONAL AGRICULTURE



Physical mechanisms:

- Habitat homogenisation and landscape simplification.
- Increased frequency of grassland cutting and intensive tillage.
- Use of heavy machinery that impacts soil structure and fauna (Henle et al., 2008; Pe'er et al., 2014).



Chemical mechanisms:

- Synthetic fertilisers boost a few fast-growing species, outcompeting others.
- Pesticides and herbicides eliminate non-target species and disrupt food webs.



Mechanical mechanisms:

- Soil compaction and disturbance from heavy machinery.
- Loss of fallen grain as a food resource for wildlife.

CONSEQUENCES OF BIODIVERSITY LOSS



Ecosystem imbalance:

- Reduced biodiversity weakens ecosystem resilience, making agricultural systems more vulnerable to pests, diseases, and climate change.



Emergence of diseases:

- Loss of habitats and species diversity can lead to new diseases in wildlife, with potential spillover to humans (Sattenspiel, 2001; Johnson et al., 2020).

BENEFITS OF AGROECOLOGY

According to the HLPE report (2019), **agroecological practices harness, maintain, and enhance biological and ecological processes in agricultural production.** This reduces the use of purchased inputs, including fossil fuels and agrochemicals, and creates more diverse, resilient, and productive agroecosystems.

- ✿ **Enhanced biodiversity:** Agroecological practices promote species diversity, soil health, and ecosystem stability.
- ✿ **Improved ecosystem services:** Natural pest control, improved pollination, and better water management.
- ✿ **Sustainable landscapes:** Preservation of habitats like hedgerows and wetlands, maintaining ecological balance.



AGROECOLOGICAL PRACTICES

- **Diversification:** Promoting a variety of crops and livestock to enhance ecosystem resilience.
- **Mixed cultivation and intercropping:** Growing multiple crop species together to mimic natural ecosystems and reduce pest outbreaks.
- **Cultivar mixtures:** Using different varieties of crops to improve resistance to pests and diseases.
- **Habitat management techniques:** Creating habitats for crop-associated biodiversity, such as planting hedgerows or maintaining wetlands.
- **Biological pest control:** Using natural predators and other biological methods to control pests.
- **Soil improvement:** Enhancing soil structure and health through organic amendments and reduced tillage.
- **Biological nitrogen fixation:** Utilising leguminous plants to naturally fix nitrogen in the soil.
- **Nutrient, energy, and waste recycling:** Returning organic matter to the soil and efficiently using on-farm resources.





A study in France showed that farms practicing agroecology had 20% more bird species compared to conventional farms (Duru et al. 2015).



In Brazil, agroforestry systems have increased soil organic matter by 30% and improved water infiltration rates by 25% (Montagnini et al. 2004).

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With the financial support from the LIFE Program of the European Union, the Fondation de France



More information

www.agroecology-europe.org

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