

# Agroecology: A Transformative Opportunity for Biodiversity and the Rio Conventions

**A**groecology represents an unparalleled opportunity to address biodiversity loss while providing simultaneous, multiple co-benefits to climate adaptation, food security, water conservation, ecosystem resilience, sustainable livelihoods and human rights. As substantiated by scientific evidence,

agroecology addresses many of the direct and indirect drivers of biodiversity loss. Given that monoculture and industrial food systems are recognized threats to biodiversity, we have an opportunity to transform food systems towards biodiverse agroecology, with substantial co-benefits to achieve the goals of the three Rio Conventions and more.

This brief originated in the leadup to COP15 of the Convention on Biological Diversity (CBD) in December 2022, with a focus on agroecology and agricultural biodiversity as central to the Kunming-Montreal Global Biodiversity Framework (KMGBF). While it retains this biodiversity focus, it has been expanded to include climate and land considerations.



Agroecology and its focus on agricultural biodiversity is critical to all three pillars of the Convention on Biological Diversity: conservation, sustainable use, and equity<sup>1</sup>. It is also crucial to achieving national commitments on climate change (NDCs, NAPs), sustainable development goals (SDGs) and food security (Food Systems Pathways)<sup>2</sup>. Now that agroecology is in the KMGBF text (Target 10), it is time to accelerate national efforts to enhance food systems through agroecology.

Despite various efforts (e.g. the CBD Program of Work on Agricultural Biodiversity in the 1990s), agriculture as a whole, and specifically agroecology, have remained low

on international biodiversity and climate agendas<sup>3</sup>. Significantly, the text of the “Joint Work on Implementation of Climate Action on Agriculture and Food Security” from the UNFCCC COP27 fails to mention agroecology<sup>4</sup>. These omissions are cause for grave concern over the likelihood of missing a key opportunity for widespread food systems transformation through agroecology, and its co-benefits for climate change, land degradation, water conservation and biodiversity loss beyond the farm, across landscapes and across scales.

## What is agroecology?

**Agroecology is a holistic and integrated approach that simultaneously applies ecological and social concepts and principles to the design and management of sustainable agriculture and food systems.** It seeks to **optimize the interactions between plants, animals, humans and the environment** while also **addressing the need for socially equitable food systems** within which people can exercise choice over what they eat and how and where it is produced.

Agroecology is concurrently a science, a set of practices and a social movement and has evolved as a concept over recent decades to expand in scope from a focus on fields and farms to encompass the entirety of agriculture and food systems. It now represents a **transdisciplinary field that includes the ecological, socio-cultural, technological, economic and political dimensions of food systems, from production to consumption.** [FAO Agroecology Hub](#)

<sup>1</sup> Agroecology is explicitly included in the text of the KMGBF (Target 10).

<sup>2</sup> NDCs are Nationally Determined Contributions for the UNFCCC; NAPs are National Adaptation Plans for the UNFCCC, SDG refers to the Sustainable Development Goals.

<sup>3</sup> COP Decision II/15 <https://www.cbd.int/decision/cop/?id=7088>. For a description of the ‘special nature’ of agricultural biodiversity, see CBD, Agricultural Biodiversity: Why is it Important? <https://www.cbd.int/agro/importance.shtml>.

<sup>4</sup> Despite the omission from the COP27 text, some countries (such as Uganda) have included agroecology in their Nationally Determined Contributions (NDCs).



## International support for agroecology is well established.

International support for agroecology is well established. Numerous authoritative reports have emphasized the **critical place of agricultural biodiversity, agroecology and resilient food systems** in the fight against climate change, biodiversity loss, and land and ecosystems degradation – and as a viable way of sustaining the livelihoods of the communities that maintain them<sup>5</sup>.

Governments and intergovernmental agencies are joining in: the Agroecology Coalition (established in 2021), includes more than 45 governments committed to agroecology (among them France, Spain, Switzerland, Norway, Mexico, Costa Rica, Senegal, Ethiopia, Uganda, Morocco, Thailand, Philippines and Vietnam)<sup>6</sup>. Regional bodies like the European Commission and African Union Commission, and international agencies (including IPBES, IPCC, UNEP, FAO, IFAD, UNDP, UNCCD and others) agree that **agroecology can significantly contribute to climate adaptation and reducing carbon emissions**. Many philanthropic foundations are leading the call for increased funding for agroecology, and

are supporting the research and evidence building to enable the transformative role for agroecology<sup>7</sup>.

Following the adoption of the KMGBF, governments are developing national biodiversity strategies and action plans (NBSAPs) to set goals for biodiversity conservation and sustainable use<sup>8</sup>. In addition, they face the challenges of building several national strategies simultaneously: climate plans (NDCs and NAPs), national SDG action plans, and plans to combat desertification, land degradation and food insecurity.

**Using a food systems lens can facilitate a comprehensive dialogue between national commitments, and centre agroecological approaches within these national implementation plans.**

**This brief offers five key messages to guide policymakers as they develop national action plans and sustainability targets, with a specific focus on NBSAPs.**

**“The sustainable agriculture transition: redesigning agricultural systems through agroecological and other innovative approaches [...] 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”.**

**CBD, Global Biodiversity Outlook 5**

<sup>5</sup> FOEI 2021.

<sup>6</sup> For a full list of countries, see <https://agroecology-coalition.org/agroecology-coalition/membership/>.

<sup>7</sup> Global Alliance for the Future of Food 2021; Biovision & IPES-Food 2020; IPES-Food 2016.

<sup>8</sup> Full text of the KMGBF: <https://www.cbd.int/article/cop15-final-text-kunming-montreal-gbf-221222>.



## Key messages

**1 Industrial food systems are the main driver of biodiversity loss and ecosystems degradation. Without transforming food systems, we will not be able to reverse these highly destructive impacts.**

Industrial food systems drive climate change, biodiversity loss and land degradation. The three crises share a common driver and also exacerbate one another through cycles of deforestation and land conversion to intensive agriculture, which lead to biodiversity loss, climate vulnerability, and land degradation. The evidence has been clearly established that agriculture and land use change are one of the main drivers of biodiversity loss<sup>9</sup>. Agriculture alone is the identified threat to 86% of the 28,000 threatened species. It is **large scale industrial agriculture, with monocropping and high external inputs**, which bears the responsibility for the destruction. As the Land Gap Report states<sup>10</sup>,

**Land conversion for industrial agriculture and agricultural intensification are the two prime causes of global biodiversity loss through land use change.**

In the last century, we have lost most of the world’s crop and animal genetic diversity. Currently, only twelve plants and five animals make up 75% of the world’s consumption, with just three crops (wheat, rice and corn) accounting for more than half of the world’s

staple foods<sup>11</sup>. According to IPBES, 75% of the planet’s land surface is significantly altered; 66% of the ocean has experienced serious negative impacts; and more than 85% of wetlands have been lost. Furthermore, the global industrial food system is responsible for one-third of all greenhouse gas emissions and uses 70% of fresh water<sup>12</sup>.

Agriculture is responsible for 80% of global deforestation



**80%** Global deforestation

Food systems release 27% of global GHGs



**27%** Global GHGs

Agriculture accounts for 70% of freshwater use



**70%** Freshwater use

Drivers linked to food production cause 70% terrestrial biodiversity loss



**70%** Terrestrial biodiversity loss

Drivers linked to food production cause 50% freshwater biodiversity loss



**50%** Freshwater biodiversity loss

52% of agricultural production land is degraded



**52%** Degraded agricultural land

“The loss of diversity, including genetic diversity, poses a serious risk to global food security by undermining the resilience of many agricultural systems, including due to pests, pathogens and climate change”.

IPBES Global Assessment

Figure 1. The environmental impacts of food production. Re-drawn from WWF 2021, Farming with Biodiversity.



## 2 Agroecology works with nature and has the power to substantially achieve multiple national targets across issues and scales.

**Agroecology is the untapped opportunity to tackle biodiversity loss, climate change, land degradation and the food crisis all at once.**

As a systems approach, **agroecology addresses the various parts of our food system to greatly enhance agricultural biodiversity and its multiple benefits** – from production to consumption, and at various scales from farm to landscape to food systems<sup>13</sup>. A vast body of diverse knowledge, expertise and scientific evidence on agroecology shows its transformative potential for the world. Studies of agroecological performance around the world by FAO have proven its substantial co-benefits and its potential to be scaled out in diverse landscapes, strengthening the ecosystem resilience, food security and the economic and social viability of territorial food systems. According to IPES-Food, **investing in agroecology produces multiple benefits right across the development spectrum, simultaneously enhancing 15 of the 17 SDGs**<sup>14</sup>.

While industrial food systems are destroying biodiversity, **small biodiverse family farms are at the forefront of conserving and the sustainable use of agricultural biodiversity**. They produce the majority of the world's food and hold the most diverse and sophisticated knowledge of agricultural biodiversity – in their fields, pastures, seeds, forests, and waters. Peasants and family farmers commonly practice biodiverse agroecology grounded in Indigenous and traditional knowledge. Their practices, combined with transdisciplinary research and co-innovation, nurture

heterogeneous biodiversity which provides food, energy, fodder, medicine, shelter and livelihoods for their communities, and conserves biodiversity for the entire planet<sup>15</sup>.

**“Ensure the full, equitable, inclusive, effective and gender-responsive representation and participation in decision-making, and access to justice and information related to biodiversity by indigenous peoples and local communities, respecting their cultures and their rights over lands, territories, resources, and traditional knowledge, as well as by women and girls, children and youth, and persons with disabilities and ensure the full protection of environmental human rights defenders”.**

**KMGBF Target 22**

**We need more farmers at the policy table**, bringing concrete, scalable solutions to produce nutritious food, nurture ecosystems and territories, and reverse biodiversity loss. They are critical to maintaining and sustainably using **agricultural biodiversity on-farm and in-situ, in their landscapes and territories, particularly the heterogeneity and variety within species (also known as intra-specific biodiversity)**.

<sup>9</sup> IPBES 2019; IPCC 2019.

<sup>10</sup> The Land Gap Report 2022.

<sup>11</sup> FAO, What is Happening to Agrobiodiversity <https://www.fao.org/3/y5609e/y5609e02.htm>.

<sup>12</sup> IPBES 2019.

<sup>13</sup> HLPE 2019.

<sup>14</sup> IPBES-Food 2016.

<sup>15</sup> FAO 2019; IPC 2016.



### **3 A food systems lens, grounded in agroecology, is central to the implementation of the KMGBF, and to national climate, food and development strategies. Without agroecology, key national goals and targets risk being missed.**

**“Supporting biodiverse agroecology is an opportunity to substantially transform food systems”. IPBES 2019**

Agroecology is an integrated approach, and **highly strategic for addressing the three pillars of the Biodiversity Convention: conservation, sustainable use, and equity.** It must be given a central place in the implementation of Target 10 of the KMGBF. It is also critical to the intersecting targets related to food systems - in particular Target 1 (spatial planning), Target 2 (restoring degraded ecosystems), Target 3 (area-based conservation), Target 7 (addressing pollution), Target 8 (climate change), Target 9 (sustainable use), Target 11 (restoration of degraded ecosystems), Target 18 (addressing subsidies and incentives), Target 21 (knowledge sharing), Target 22 (inclusion and participation) and Target 23 (gender equality).

**Strong national commitments to agroecological approaches must be a key part of National Biodiversity Strategies and Action Plans,** including planning, implementation and monitoring. Clear indicators and monitoring developed through inclusive processes with the full participation of Indigenous Peoples and local communities, will be essential. In this regard, secure land tenure for Indigenous Peoples (IPs) and Local Communities (LCs) is critical. As the Land Gap Report finds<sup>16</sup>:

**Evidence to date shows that IPs and LCs with secure land rights vastly outperform both governments and private landholders with respect to the multiple goals of preventing deforestation, conserving and restoring biodiversity, and producing food sustainably. However, recognition of rights to land, resources and/or territory has been partial, limited and fraught, while subject to opposition.**

#### **KMGBF TARGET 10**

**Target 10 of the KMGBF is the most relevant and critical place for agroecological approaches.**

**It states:**

Ensure that areas under agriculture, aquaculture, fisheries and forestry are managed sustainably, in particular through the sustainable use of biodiversity, including through a substantial increase of the application of biodiversity friendly practices, such as sustainable intensification, agroecological and other innovative approaches contributing to the resilience and long-term efficiency and productivity of these production systems and to food security, conserving and restoring biodiversity and maintaining nature’s contributions to people, including ecosystem functions and services.

<sup>16</sup>The Land Gap Report 2022.



**Linking Implementation and National Plans Beyond the KMGBF.** It is paramount that NBSAPs and their targets include specific text that promotes and supports agroecology, enhance agroecological approaches and agricultural biodiversity, and Indigenous food systems; and recognize the peasants, small-scale farmers, livestock farmers, pastoralists, artisanal fishers, forest dwellers, and Indigenous Peoples who preserve agricultural biodiversity in their territories, lands and waters.

**Agroecological principles can provide an enabling framework for implementation to happen in a systemic way.** The thirteen principles of agroecology<sup>17</sup> can be well aligned with the means of implementation in the KMGBF as well as bringing coherence between national NDC, UNCCD, SDG and food systems action plans.

**“Nature can be conserved, restored and used sustainably while other global societal goals are simultaneously met through urgent and concerted efforts fostering transformative change”.**  
KMGBF

**The Critical Role of Governance.** National biodiversity, climate, desertification and food systems action plans must ensure that **collective rights** of Indigenous Peoples and Local Communities, peasants, family farmers, pastoralists, fishers, agricultural and food workers, landless, women and youth are respected and fulfilled. Individual rights such as the right to food, water, housing, and health, are equally essential. Established international principles, protocols and declarations must be explicitly recognized in the development, implementation and monitoring of national frameworks and policies. Key principles include Free, Prior and Informed Consent (FPIC), the UN HLPE Thirteen Principles of Agroecology, Farmers Rights, the Precautionary Principle, the Tenure Guidelines on Land, Forests and Fisheries, the UN Declaration on the Rights of Peasants (UNDROP) and the UN Declaration on the Rights of Indigenous Peoples (UNDRIP). These are directly related to Targets 21, 22, and 23 of the KMGBF.

**“Improved governance and stewardship of land and territories is sorely needed to achieve multiple interrelated objectives”.**  
The Land Gap Report 2022



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<sup>17</sup>These include the co-creation of knowledge, land and natural resource governance, connectivity, biodiversity, soil and animal health, recycling and input reduction, participation and social values. HLPE 2019.



## 4 There are vital connections between agroecology and conservation.

**Agroecology, by its multifunctional nature, lends itself extremely well to dovetailing sustainable food systems with conservation objectives - particularly at a landscape level.** Agroecological practices within biodiverse landscapes allow farmers and food provisioners to work with nature and strengthen the biological diversity in plants, animals, trees, and soil species, thereby enhancing ecosystems, habitats and farming systems simultaneously.

**“Agroecologists have a profound understanding of the ecological principles underlying sustainable agriculture, while the biodiversity conservation sector possesses expertise in preserving and restoring ecosystems. These communities could come up with strategies for sustainability that are more comprehensive, coherent, and effective if they capitalize on their joint expertise”.**  
FAO, Biovision & Agroecology Coalition  
2023

Despite being less explicitly discussed, agroecology offers numerous contributions to the conservation of biodiversity and ecosystems beyond the farm. These include enriched heterogeneity and intra-specific diversity (particularly through on-farm and in-situ conservation and farmer-led research), maintaining complex connectivities between natural habitats and agricultural landscapes, enhancing ecosystem integrity and critical functions, and strengthening the food sovereignty of farmers and food provisioners, while upholding their critical efforts to

safeguard their lands, territories, waters, seeds and natural resources.

Furthermore, as a holistic and innovative framework, **agroecology enables dynamic interactions and synergies across the food system, and bypasses many of the tradeoffs of singular interventions** (many of which rely on intensification and narrowly focused technologies, often generating negative consequences in other parts of the food system). Using a landscape and territorial perspective brings in the larger context in which agroecological practices take place, such as the interactions between agricultural and natural systems, the impacts of land use changes on the environment and local communities, and the potential for integrated approaches to land use management. As FAO and Biovision concluded in a recent dialogue<sup>18</sup>:

**By adopting a landscape perspective, agroecologists can better understand the impacts of agriculture on biodiversity and develop strategies and practices that support the conservation of biodiversity.**

For instance, a landscape perspective can help to identify areas where agriculture and conservation can be integrated, such as through the establishment of agroforestry systems or the creation of corridors for the movement of wildlife. Additionally, a landscape perspective can also support the development of innovative and diverse farming systems that are better adapted to local conditions and more resilient to challenges such as climate change.



## Agroecology can significantly contribute to biodiversity conservation beyond the farm in a broad range of landscapes

As an inherently systemic approach, agroecology can benefit biodiversity and the processes that support it, across a broad range of landscapes. Below are some examples of these contributions for one of the many landscape typologies used in rural and conservation planning.



### Production landscapes

- Increase overall biodiversity dimensions (e.g. species richness and abundance, as well as ecosystem connectivity);
- Increase landscape complexity and suitable habitat for species of local and global importance;
- Support pollinator and insectivorous communities that are currently in decline; and
- Support ecosystem restoration efforts by improving soils and vegetation cover.



### Mosaic landscapes

- Reduce edge effects in natural habitats within the landscape;
- Support species movement and dispersal through the landscape;
- Reduce runoff impacts to wetlands and other water ecosystems; and
- Maintain ecological processes, like local climate regulation, that are key to the long-term persistence of natural habitats.



### Intact/semi-intact landscapes


- Increase connectivity between conserved landscapes;
- Support food security of communities in buffer areas around these landscapes (e.g. through agroforestry);
- Support alternative livelihood options such as ecotourism that can direct more funding towards conservation; and
- Support the sustainable use of the species associated to these landscapes by increasing diversity within farming systems.

**Figure 2.** Contributions of agroecology to biodiversity conservation across different landscapes. Re-drawn from FAO, Biovision & Agroecology Coalition 2023.



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<sup>18</sup>In September 2022, FAO and Biovision brought together more than 60 biodiversity and conservation policy and practice experts for a dialogue exploring synergies between agroecology and conservation. The workshop report can be found at <https://www.agroecology-pool.org/agroecology-dialogue-series/>.



## 5 A call to action: Support biodiverse agroecology for sustainable food systems and climate resilience.

“The framework aims to catalyze, enable and galvanize urgent and transformative action by Governments [...] and all of society”. **KMGBF**

### We call on countries to support agroecology in their national plans in the following ways:

- Ensure the **central place of biodiverse agroecology** in the development of national goals, targets and indicators of NBSAPs, NDCs, UNCCD and SDG strategies and action plans.
- Increase the **resources and support** for developing multi-sector national planning frameworks, goals, targets, and indicators that enhance the **coherence and impact of multiple interventions**.
- Support the **full inclusive participation** of vital organizations at the front lines of biodiversity conservation and sustainable use (particularly Indigenous Peoples and Local Communities, and farmers/food provisioners organizations) in the **development, implementation and monitoring** of national action plans.

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