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DEFINITIONS OF AGROECOLOGY

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1. INTRODUCTION

Agri-food systems are facing various challenges such as climate change, environmental degradation, and growing risks to human and animal health and welfare. It is estimated that 52% of global agricultural land is now degraded, with over 60% of human-induced degradation concentrated on croplands and pastures [1]. At the same time, agriculture and land-use change contribute around 17–32% of global greenhouse gas emissions driving several planetary boundaries into high-risk zones. These interconnected crises leave the poorest countries and especially small subsistence farmers to bear the heaviest burden of climate change and its impacts [2].

The dominance of conventional agriculture has been linked to these growing agri-food system challenges as a result of its extractivist nature [3]. It is characterized by the use of synthetic fertilizers and pesticides, intensive tillage, and monocropping or limited crop rotations to achieve high yields. This production model has been associated with soil degradation, declining soil organic carbon and biodiversity, nutrient depletion, overreliance on chemical pesticides and reduced resilience to climate related shocks like droughts and extreme rainfall, ultimately threatening long-term agricultural productivity [4]. Farm consolidation and industrial monocultures have reduced agricultural diversity and created resource-intensive and inefficient food systems that still fail to adequately address global hunger and malnutrition [2,5,6]. These challenges highlight the need to transform agri-food systems towards more sustainable and equitable models. This requires improving the productivity and resilience of smallholder farming systems while also transitioning environmentally destructive, energy and chemical-intensive industrial agriculture to more sustainable approaches [7]. A range of sustainable agriculture approaches have emerged to improve the environmental sustainability and social outcomes of food systems, as illustrated in Figure 1 [8,9].

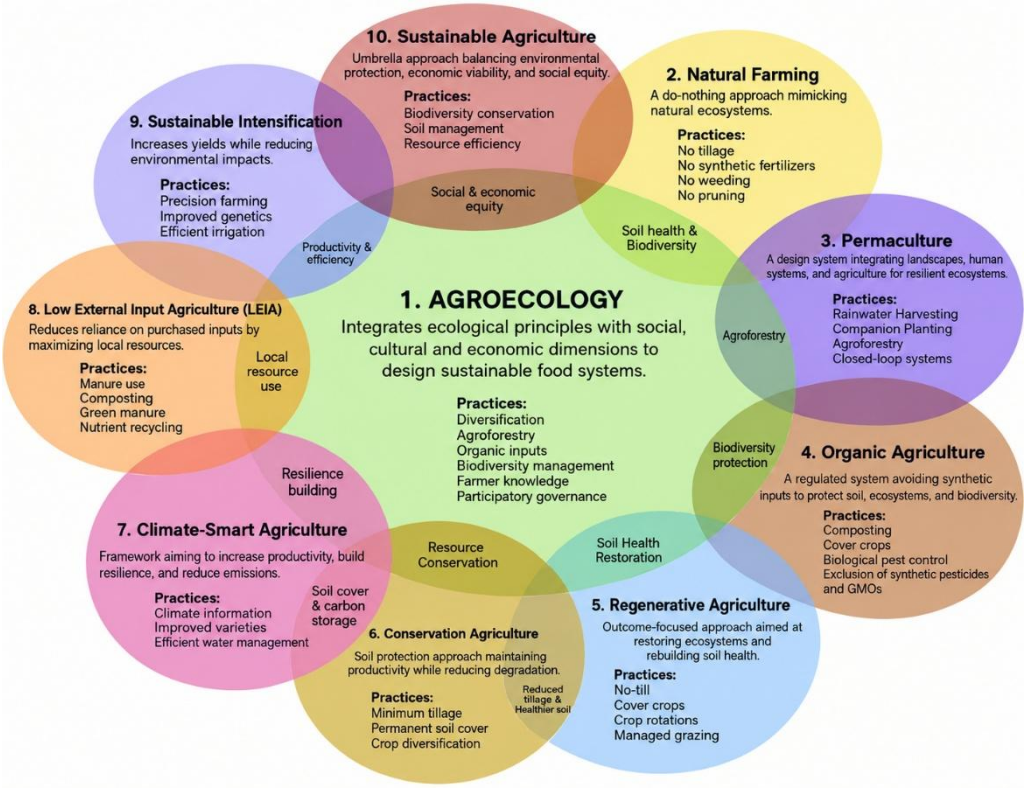


Figure 1. Agroecology and related approaches

Agroecology has emerged as a leading alternative for transforming agri-food systems. However, despite more than 90 years of development, the concept remains contested, with no universally accepted definition.

Box 1: Classification of activities			
Climate in Agri-Food Systems focuses on integrating climate mitigation and adaptation into agri-food systems through policy, NDC implementation and climate finance. Here activities primarily target **emissions reduction and resilience to climate risk**s such as methane reduction, renewable energy, carbon sequestration, climate-resilient crops and water management.	Biodiversity addresses the **conservation, restoration and sustainable use of biological diversity** at genetic, species and ecosystem levels. Activities here include habitat restoration, pollinator protection, crop and livestock diversification, and soil biodiversity conservation.	Bioeconomy focuses on the **sustainable production, processing and valorisation of renewable biological resources** to create food, materials, products and energy. Unlike agroecology, its primary focus is the economic use of biological resources.	Agroecology prioritizes the **ecological and socio-economic transformation of agricultural and food systems**, applying ecological principles alongside farmer knowledge, participation, equity and sustainable livelihoods. Climate and biodiversity outcomes may be part of agroecology, but are not synonymous with it.
In order to cluster activities these categories should be assigned based on the **primary objective and indicators of success**. An activity may contribute to multiple categories, but its primary category should be reflecting its main intended outcome.			

Its meaning has evolved over time and varies across academic institutions, civil society organizations, non-governmental organizations, and policymakers, as well as across geographical and cultural contexts. As countries increasingly integrate agroecology into agricultural policies and development strategies, different interpretations of the concept creates challenges for its implementation and operationalization.

This policy brief provides both a descriptive review of how agroecology has evolved and is defined by key actors, and policy guidance on the implications of these different understandings. We map the variations in definitions systematically by going beyond differences in terminology to examine the underlying assumptions about knowledge, power, and pathways for transformation. We also then draw on examples from Europe, Africa, and South America, to explore how these different understandings have been adopted in national agroecology policies and strategies, and highlight the implications of the adoptions of different definitions in practice for policy or program design, implementation, and support for agroecological transitions[*].

2. EVOLUTION OF THE DEFINITION

The definition of agroecology has evolved from a farm-bound biophysical science in the late 20th century into a highly politicized, holistic framework that encompasses the global food system. Agroecology emerged in the 1930s as an ecological approach to agriculture, initially focusing on interactions within agroecosystems [10,11]. Altieri (1983) defined it as the application of ecological principles to agriculture, emphasizing farmers' knowledge and their role as stewards of landscapes, biodiversity, and food systems [12]. Key ecological principles included nutrient recycling, soil health improvement, resource conservation, diversification, and the promotion of beneficial biological interactions [13,14].

From the 1980s, agroecology expanded beyond a scientific discipline to include sustainable farming practices and social movement elements, especially in Latin America (Table 1A in the appendix gives a summary of key definitions). By the 1990s and 2000s, scholars such as Wezel and Gliessman emphasized its broader role in challenging industrial agriculture and transforming food systems [10,15,16]. Other scholars further highlighted its contributions to productivity, poverty reduction, nutrition,

[*] *The analysis is based on a review of existing literature, policy documents, and other publicly available sources and is therefore a desktop study, it does not draw on interviews conducted specifically for this study*.

climate resilience, farmer autonomy, and reduced reliance on external inputs [17–19]. More recently agroecology has been framed through broader, integrated frameworks. In 2019, the Food and Agriculture Organization of the United Nations (FAO) endorsed its 10 Elements of Agroecology that is more holistic, systemic, and policy-oriented, that covers diversity, co-creation of knowledge, synergies, efficiency, recycling, resilience, human and social values, food traditions, responsible governance, and circular and solidarity economies [20].

In the same year, the United Nations Committee on World Food Security (CFS) High Level Panel of Experts (HLPE) proposed 13 principles of agroecology, that is scientifically oriented and organized around resource efficiency, resilience, and social equity and responsibility [21]. Together, these frameworks show the evolution of agroecology from an initially ecological and farm-level concept toward a broader social-ecological approach to food-system transformation. However, definitions continue to vary across researchers, institutions, civil society organizations, and social movements, making agroecology a contested concept with different interpretations of its scientific, practical, and political dimensions.

2.1 Key similarities across definitions

Definitions of agroecology have several similar foundational concepts:

- **The ecological emphasis:** these definitions highlight the optimization of natural processes such as biomass recycling, soil health enhancement via organic matter, maximizing biodiversity, and minimizing external inputs.
- **Rejection of industrial monoculture:** Across definitions, the intensive use of external chemical inputs and the simplification of ecosystems are rejected in favor of biological synergies.
- **Systems thinking:** Definitions adopt a holistic, systems-level perspective on agriculture, this is regardless of whether they are applied to smallholder or industrial farming systems. They do not focus solely on individual crop yields, but they emphasize the interactions among ecological, social, and economic components of farming systems and the broader agroecosystem.

2.2 Key differences across definitions

The definitions differ across various aspects.

2.2.1 Number of dimensions

One of the key differences across definitions is whether agroecology is understood as one, two, or three interconnected dimensions. This distinction has significant implications for how agroecology is conceptualized, operationalized, measured, and governed.

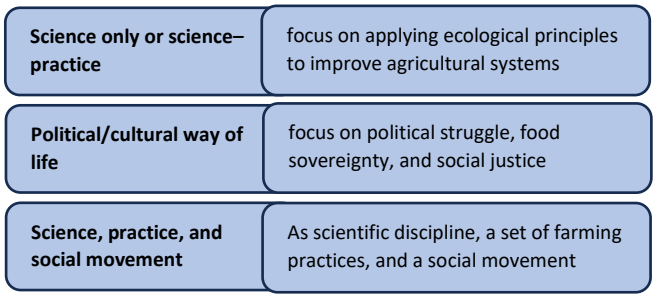


Figure 2. Dimensions of agroecology

2.2.2 Scale

Another key difference is the scale at which agroecology is understood to operate. This is not only a question of empirical scope it also reflects different theories of where change must happen for agroecology to succeed. At the farm level the focus is on practices e.g crop diversification, intercropping. The food system scale encompasses production, input supply, processing, distribution, markets, consumption, and governance. Territorial/political scale refers to the level at which collective action, governance, and power relations shape food and agricultural systems that can include local, subnational, and regional levels.

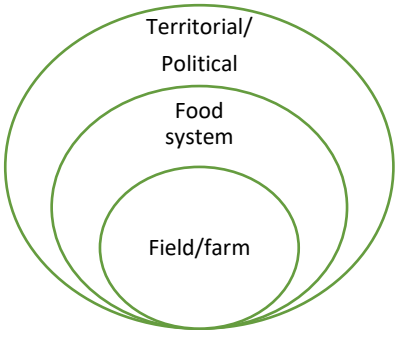


Figure 3: Scale of operation

2.2.3 Ecological core

Another significant divergence within the ecological content of definitions is in the treatment of external inputs such as synthetic fertilizers, pesticides, and GMOs.



Strict view, framing agroecology zero synthetic input use



Flexible institutional framing emphasizing reduced reliance on external inputs, and the optimization of ecological processes

2.2.4 Typology of definitions

Agroecology can be understood in three broad ways, ranging from technical farming practices to wider transformation of food systems. These are best understood as analytical groupings but not rigid categories that reflects different views of what agroecology is and what it seeks to achieve. The breadth of agroecological principles increases across these conceptions. Technical definitions emphasize a small set of ecological principles, integrated frameworks expand these to include social and governance dimensions, while transformative frameworks include a wider range of political and structural principles aimed at systemic food system change.

Table 1. Typology of definitions summary

Technical-ecological	application of ecological principles to farming systems.
Integrated systems	extend agroecology beyond the farm to encompass food systems, governance, and social equity.
Transformative or political	position agroecology as a vehicle for structural change in food systems.

3. GEOGRAPHICAL ADOPTIONS

The definitions that governments, regional bodies, and international institutions adopt determine which practices receive public investment, which actors are included in governance, and whether food system transformation is understood as a technical upgrade or a structural reorganization of power.

- **Latin America:** Most of Latin America has adopted the most transformative interpretations of agroecology. Countries such as Colombia and Bolivia, together with regional bodies like the Latin American and Caribbean Parliament (PARLATINO), frame agroecology not just as a practice but also as a pathway for food sovereignty, territorial autonomy, social justice, and the recognition of ancestral knowledge. These definitions are connected to multi-actor governance arrangements involving governments, farmer organizations, civil society, and territorial actors.
- **Europe:** European countries have mostly adopted an integrated systems approach. The European Union's agroecology-related policies incorporate ecological transition pathways, for instance input reduction, substitution, and system redesign, but it remains embedded within existing agricultural policy structures. There is an absence of concepts such as food sovereignty and stronger political transformation that reflects the institutional constraints of balancing environmental ambitions with established production systems.

  The EU has increasingly embedded agroecology in its domestic and international policy agendas. The European Green Deal, Farm to Fork and Biodiversity Strategies, and the Common Agricultural Policy promote measures aligned with agroecological principles. It is also recognized in EU development cooperation and external action, including through NDICI–Global Europe, the 2025 Operational Guide on Agroecology, Global Gateway and Horizon Europe. EU–Africa cooperation also supports resilient and sustainable food systems, agroecological practices, local knowledge and innovation. Germany, France and Switzerland complement these efforts through bilateral strategies and programs supporting agroecological transitions.
- **Africa**: The continent shows diverse and rapidly evolving trajectories. Some countries for example Kenya, Ethiopia, Nigeria and Burkina Faso, have developed dedicated agroecology strategies that combine ecological principles with food system, social, and governance dimensions

(Figure 4). Other countries such as Togo, Cameroon, Malawi & Zambia are integrating agroecological principles into broader agricultural, climate, and resilience policies. Regional initiatives, including those led by The Economic Community of West African States (ECOWAS), the East African Community (EAC), and civil society actors, increasingly introduce transformative elements such as farmer-managed seed systems, indigenous knowledge, and participatory governance. The Southern African Development Community (SADC) and the Economic Community of Central African States (ECCAS) have no dedicated agroecology policy, but several regional frameworks incorporate agroecological principles such as sustainable agriculture, resource conservation, and diversification. Across regions, the HLPE framework provides an important reference point, but countries and regional bodies adapt it to local priorities that might incorporate elements such as indigenous knowledge, cultural identity, reduced input dependence and food sovereignty.

4. WHAT DEFINITIONAL CHOICE MEANS IN PRACTICE

Adopting definitions that require the elimination of synthetic inputs may create challenges for governments that seek to reconcile agroecological ambitions with existing agricultural support systems, including fertilizer subsidies and other input-based programs. In contrast, definitions focused on input reduction or efficiency may allow approaches such as precision agriculture, reduced-input technologies, and climate-smart input packages to be considered agroecological. This distinction influences how agroecological programs are designed, including whether they can be integrated into existing agricultural value chains and support mechanisms or require dedicated implementation pathways.

Secondly, definitions differ not only in what practices they promote, but also in the scale at which they understand the causes of and solutions to agricultural challenges. Farm-scale approaches focus on improving ecological processes within production systems, while integrated food system approaches recognize the influence of markets, supply chains, and consumption patterns. Transformative approaches go further by addressing governance, power relations, and control over resources such as land, seeds, and knowledge.

Burkina Faso – National Strategy for the Development of Agroecology (SND -AE), 2023–2027
- Integrated systems definition
- In response to environmental degradation, food insecurity, climate risks and rural poverty
- Promotes agroforestry, natural regeneration, organic fertilizers, bio-inputs, watershed and pastoral management, and traditional practices (e.g. zaï)
- Estimated budget FCFA 19.5 billion (~US$35 million)
- Targets 50% of producers adopting agroecological practices and 35% of cereal production from agroecological farms by 2027, alongside improved yields, resilience and reduced rural poverty

Ethiopia – National Agroecology Strategy for Food System Transformation (NAES), 2026–2040
- Integrated systems definition
- Adopted as a result of soil degradation, climate vulnerability, biodiversity loss and food insecurity, aiming to reduce dependence on external inputs
- Promotes ecosystem-based agriculture, ecosystem restoration, reduced chemical use, knowledge sharing, sustainable value chains and healthy diets, prioritizing women, youth, pastoralists and vulnerable groups
- Implementation is coordinated nationally and sub-nationally, funded through government budgets, development partners, private investment, climate funds and payments for ecosystem services



Nigeria – National Agroecology Strategy, 2026–2030
- Integrated systems, transformative/ political definition
- Responds to soil degradation, biodiversity loss, climate vulnerability and food insecurity
- Prioritizes soil and biodiversity conservation, organic inputs, sustainable livestock, extension and research, local value chains and healthy diets, with a focus on smallholders, women and youth
- Funded through government, development partners and private sector co-financing, with implementation monitored using the FAO TAPE framework

Kenya – National Agroecology Strategy for Food System Transformation (NAS-FST), 2024–2033
- Integrated systems definition
- A response to food insecurity, soil degradation, pesticide related health risks, high input costs and climate shocks
- Promotes agroforestry, organic and regenerative agriculture, permaculture, soil and water conservation, integrated pest management and circular food systems, while emphasizing traditional knowledge, healthy diets and inclusion of women, youth and Indigenous peoples
- Estimated budget of KES 26.8 billion (~US$208 million), financed through government, development partners, private investors and NGOs, with implementation coordinated across national and county levels

Figure 4: Examples of countries with national agroecology strategies

These differences have direct implications for program design, as they determine the types of interventions, partnerships, indicators, and theories of change[†] required.

Third, agroecology definitions differ in how they understand the role of knowledge in agricultural transformation. While scientific approaches mostly view farmers as recipients of externally generated knowledge, the recent frameworks emphasize co-creation and recognize farmer, indigenous, and local knowledge as important sources of expertise. This then raises an important question about the role of farmer organizations and indigenous knowledge holders in program design.

Finally, definitions also differ in who is expected to lead and govern the transition. While most national strategies are state-led, many successful agroecological initiatives rely on strong participation from farmer organizations, civil society, and local communities. These governance models influence how programs are implemented, how knowledge is shared, and how resilient agroecological transitions are to political change. For development partners, governance choices shape who is engaged, how interventions are designed, and the pathways through which agroecological change is pursued.

5. CONCLUSION

The definition of agroecology has evolved over the years, this definitional diversity has important policy implications. The way agroecology is defined shapes program objectives, governance arrangements, investment priorities, and monitoring frameworks. It also influences whether interventions focus on improving farm management, transforming food systems, or addressing broader issues of equity, governance, and food sovereignty.

Understanding these different interpretations is important for designing programs that are aligned with national priorities and transparent about the outcomes they seek to achieve. Greater conceptual clarity can also strengthen policy dialogue, improve program design, and support more coherent agroecological transitions.

Key Recommendations

1. **Recognize the different agroecological approaches.** Distinguish between technical-ecological, integrated systems, and transformative approaches when designing or assessing policies and programs. This classification will reveal the theory of change in the policy and predicts which actors, practices, and governance structures need to be prioritized.
2. **Align the definitions with implementation and financing.** Ensure that governance arrangements, institutional responsibilities, financing mechanisms, monitoring systems, and dedicated budget allocations reflect the chosen definition and the objectives of agroecology. Adequate funding is important for translating strategies into sustained action.
3. **Promote inclusive governance**. Engage governments, research institutions, farmer organizations, civil society, and indigenous knowledge holders throughout policy and program design and implementation.
4. **Strengthen monitoring and mid-term reviews.** Establish clear indicators and conduct regular, including mid-term, reviews of strategies and policies to assess implementation progress, identify emerging challenges, and allow policies and resource allocations to be adjusted where necessary.
5. **Strengthen regional cooperation.** Regional frameworks developed by organizations such as ECOWAS, the East African Community, and PARLATINO can facilitate policy learning and support national implementation.

[†] *Here "Theories of change" refers to different assumptions about where change needs to occur, which actors need to drive it, and how changes at different levels (farm practices to food-system and territorial/political structures) can contribute to broader agroecological transformation.*

6. **Integrate gender and social inclusion.** Agroecological programs should address gender, youth, and social equity in both program design and monitoring.

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APPENDIX

Table 1A: Major Agroecology Definitions

Source	Core Definition / Focus	Scope	Scale
Altieri, M. (1995)[22]	Application of ecological concepts and principles to the design and management of sustainable agroecosystems.	Science	Farm
Gliessman (2018)[23]	Agroecology integrates ecological, social and economic dimensions of food-system sustainability through transdisciplinary, participatory and action-oriented approaches that challenge existing food-system structures.	Science + Practice + Movement	Food system
De Schutter & Vanloqueren (2011)[24]	Agroecology combines ecological science and agricultural practices to design sustainable agroecosystems by mimicking natural processes and strengthening beneficial ecological interactions.	Science + Practice	Farm
FAO (2018)[20]	A holistic and integrated approach that blends ecological and social principles in the development and re-design of sustainable agrifood systems.	Science + Practice + Policy	Food system
HLPE (2019)[21]	An integrated approach that simultaneously applies ecological and social concepts and principles to the design and management of food and agricultural systems.	Science + Practice + Movement	Food system
La Via Campesina, Nyéléni, M. (2015)[25]	A way of producing food, a way of life, a science and a movement to transform food systems towards ecological, social, gender, economic, racial and intergenerational justice.	Movement	Territorial/Food system
Sociedad Científica Latinoamericana de Agroecología (SOCLA) 2015 [26]	A science that draws on social, biological and agricultural sciences and integrates these with traditional knowledge and farmers' knowledge.	Science + Movement	Farm
SWISSAID (Civil Society) 2021[27]	Agroecology is an integrated approach that simultaneously applies ecological and social concepts and principles to the design and management of food and agricultural systems. It seeks to optimize the interactions between plants, animals, humans and the environment while taking into consideration the social aspects that need to be addressed for a sustainable and fair food system.	Science + Practice	Food system
Agroecology Europe (Civil Society) 2017 [28]	Agroecology combines science, practice, and social movement to reshape food systems from soil to society. As a science, it uses holistic, participatory, and transdisciplinary approaches that value diverse knowledge systems. As a practice, it relies on local resources, farmers' knowledge, biodiversity, and solutions that deliver multiple environmental, social, and economic benefits. As a movement, it defends smallholders, food sovereignty, local supply chains, indigenous seeds, and healthy food. It recognizes that the whole is greater than the sum of its parts, fostering collaboration across science, practice, and movements.	Science + Practice + Movement	Food system

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