Understanding the Agroecological Transition

Based on *Transición* Agroecología: Biopreparados by the Escuela Nacional de Agroecología. Source: Rural Federation.

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Throughout Latin America, peasant farmers and indigenous communities have been developing and refining agricultural knowledge for generations, passing down techniques that work in harmony with natural ecosystems rather than against them. This accumulated wisdom, combined with contemporary scientific understanding, forms the foundation of what we now call agroecology. On the other hand, in the 1960s, a commodity production model known as the Green Revolution emerged in response to the post-war food crises. What began as an effort to increase yields quickly transformed into a commercial and financial approach, with the primary objective shifting from feeding populations to maximizing profits. This transformation brought with it a dependence on monocultures, synthetic fertilizers, and an ever-increasing arsenal of agrochemicals that has left soils depleted, water sources contaminated, and farming communities trapped in cycles of debt and dependency.

What Is Agroecology?

Although the practice is ancestral, the term "agroecology" is relatively recent, and its precise meaning continues to be debated among practitioners and academics. For the Escuela Nacional de Agroecología (ENA) and the peasant movements that have shaped its principles, agroecology represents a response and an alternative to the conventional production model, a model that dispossesses farmers of the land they work, renders invisible their ancestral knowledge, and prioritizes profits for the few over dignified working conditions, access to healthy food for all, and the health of the environments in which we live.

At its core, agroecology recognizes that farms function as ecosystems, what practitioners call agroecosystems. In this view, cultivated plants, water, soil, animals, climate, and all human activity interact toward a single purpose, producing food. This demands an integrated perspective that considers all components and their relationships. The goal is to achieve a balance in managing the agroecosystem that minimizes problems through thoughtful design, ensuring biodiversity through diverse plantings. A well-designed system maintains efficiency without losing productive capacity over time, which farmers call sustainability, and recovers quickly from climate events like droughts and floods, developing what is known as resilience.

Three Principles of Agroecology

The ENA articulates three fundamental principles that distinguish agroecology from conventional agriculture.

1. The active role of peasants and farmers. Rather than being passive consumers of production techniques researched by isolated specialists and sold by corporations, farmers become active participants who recognize their working environments, observe daily realities, plan, and investigate.
2. Respect for local realities. Agroecology honors the social, cultural, and community contexts in which production takes place and which form part of local identity. The conventional model, by contrast, tends to homogenize everything, erasing history and culture.
3. Collective struggle and social transformation. Agroecology is necessarily part of a collective struggle and a commitment to transforming society in defense of life. Fighting for land tenure, for the protection of water, soil, health, communities, and cultures.

Certificate award ceremony of the 5th Agroecology Trainers Course, organized by ENA – July 2025, in the city of Hilario Ascasubi, Argentina. Source: Rural Federation.

Why Monocultures and Agrochemicals Create Vulnerability

Understanding why conventional agriculture leads to increased pest problems helps clarify the logic behind agroecological practices. The ENA manual identifies three main mechanisms through which monocultures and chemical inputs make crops more susceptible to attack.

The first mechanism involves how pests locate food. Insects find their meals primarily through sight and smell, and concentrated plantings of a single crop make this search considerably easier. Fifty rows of lettuce, a quarter hectare of broccoli alone, or five greenhouses of tomatoes present an unmissable target. When plants of different forms, sizes, scents, and colors are mixed, pests become confused and struggle to locate their preferred food source.

The second mechanism concerns natural predators. Beneficial insects such as ladybugs, lacewings, predatory flies, parasitic wasps, and predatory beetles thrive in diverse

environments that provide shelter and alternative food sources, such as nectar and pollen. In monocultures, these natural enemies of pests cannot survive, removing the ecological checks that would otherwise limit pest populations.

The third mechanism relates to soil health. When production relies exclusively on synthetic fertilizers and agrochemicals, the living components of soil, such as fungi, bacteria, and other microorganisms, are killed or disrupted. This reduces organic matter formation, degrades soil structure, and forces plants to absorb nutrients in simple, highly soluble forms. These simple nutritive substances circulating through plants attract pests precisely because they are easier to ingest and assimilate.

The Transition Process

Agroecological transition refers to the process of transforming a conventional production system into an agroecological one. This transformation encompasses not only production practices but also farm management, weed and pest control methods, forms of organization with fellow farmers, and modes of commercializing production. The transition takes time as there is no single correct path, and each farm's journey will be unique.

The ENA describes three general stages in this process, though practices do not always occur in a specific order and multiple changes often happen simultaneously.

Stage One involves substitution: Chemical insecticides, fungicides, and fertilizers are replaced with bioinputs[1], products made from natural elements generally available on the farm. These preparations do not harm health, do not deteriorate the environment, and cost significantly less than commercial inputs.

Stage Two focuses on soil recovery: Because soil functions as a living organism, the use of agrochemicals such as synthetic fertilizers, chemical pesticides, and herbicides depletes nutrients and organic matter while contaminating and killing the organisms that inhabit it. Recovery involves nourishing the soil with organic soil amendments to improve its structure, ceasing agrochemical applications to allow microorganisms to develop, and beginning to save and reproduce seeds to reduce dependence on external purchases.

Stage Three requires redesign: This transcendental step involves restructuring the farm layout itself, making it "more complex," imitating nature. Combined with soil improvement, thoughtful redesign addresses the root causes of many cultivation

[1] In Argentina, the regulatory framework defines and regulates the term 'biopreparation' for agricultural inputs made from simple materials of biological, plant, animal or microbial origin found in nature. Although in technical literature and in other Latin American countries the generic term 'bioinput' is predominantly used and considered equivalent, in the Argentine legal context the former term is preferred due to its specific legal and regulatory implications.

problems rather than merely treating symptoms. Redesign might include establishing habitat corridors for beneficial insects, integrating animals into cropping systems, or fundamentally rethinking which crops are grown where and in what combinations.

Students at the 5th Edition of the Bioinputs International School using the ENA book.Source: IAPC/BAOBAB

Guiding Principles for Transition

The ENA offers several orienting principles for farmers embarking on transition.

- Systems thinking means examining the farm as a whole: crops, soil, water, trees, and spontaneous vegetation, to understand which aspects need improvement when problems arise.
- Autonomy means seeking independence from agrochemical companies, seed corporations, and single-buyer markets.
- Low-risk systems are built through careful attention to crop health, ensuring nutrient-rich soils, maintaining populations of beneficial insects, providing

habitat for those insects, and cultivating crop diversity to spread risk across harvests.

- Valuing local resources means recovering locally-adapted seeds that can be reproduced year after year, utilizing native plants to produce bioinputs, participating in local markets, and attending seed exchange fairs.
- Diversification is fundamental; a farm with few crops is far more susceptible to pest and disease attacks than one with many.

Agroecological Production Is Not the Same as Organic Production

A common confusion equates agroecology with organic certification. While both reject synthetic chemicals, their orientations differ substantially. Organic production in Argentina primarily serves export markets and wealthy domestic consumers, often maintains long intermediary chains, may use commercial seeds, can operate as monocultures that simply substitute chemical inputs for biological ones, requires costly third-party certification, and does not necessarily address labor conditions.

Agroecological production, by contrast, aims to supply local populations with accessible, healthy food, promotes direct farmer-to-consumer commerce, encourages the saving and valuing of heritage seeds, treats biodiversity as the foundation of production, uses free participatory guarantee systems based on collective work and trust, and explicitly promotes just and dignified working conditions. The distinction matters because it clarifies that agroecology is not merely a production technique but a comprehensive approach to food systems, labor, and community.

Bioinputs and products from family farmers of the Rural Federation for Production and Local Rooting. Source: Rural Federation.

The Role of Biofactories

Replacing agrochemicals with bioinputs represents one of the first stages of agroecological transition, yet individual farmers often lack the time, inputs, or planning capacity to produce these preparations on their own farms. Biofactories, collective, cooperative spaces where bioinputs are manufactured at scale, address this challenge by making biological inputs accessible to farming families through organized community effort.

The ENA and its member organizations have established several biofactories across Argentina, viewing them as fundamental to the dispute between two models of production, the conventional agribusiness model and the agroecological model. These spaces embody the principle that the path forward is collective, transforming what might otherwise be an individual burden into shared infrastructure that strengthens entire communities.

ENA´s book and biopreparations produced in the biofactory of the city of Villalonga of the Rural Federation. Source: Baobab.

> *"Healthy food should not be the privilege of a few. Everyone has the right to adequate nourishment. For this reason, popular agroecology seeks to commercialize products at fair prices accessible to all."*
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> — Escuela Nacional de Agroecología

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