

Agroecology

Latin American farmers demonstrate the benefits of agroecology



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Hazards of pesticide dependence

Across Latin America, the widespread use of hazardous pesticides has led to serious health, environmental, ecological and socio-economic harms, impacting producers, agricultural workers and most populations residing in urban, rural and peri-urban areas. Human exposures to these pesticides can cause acute illnesses and even death. The scientific literature has also established linkages between pesticide exposure and pathologies such as cancer, congenital malformations, immune disorders, neurotoxic conditions, reproductive disorders and endocrine disruption.¹

Pesticide dependence is embedded in monocultural production. Because these systems cannot recreate the regenerative conditions of highly diverse ecosystems, they require the application of a technological package consisting of insecticides, fungicides, herbicides and fertilizers that damage the integrity and functioning of natural systems. In this process of deconstructing nature, natural cycles, flows, relationships and processes are replaced with continuous capital investment in costly chemical technologies.

The crises that we face today demand that we reflect on the bonds between all living beings and the environment, since as humans, we are an inseparable part of the environment. Consequently, we must develop strategies and practices that allow us to meet our needs in a sustainable manner, with intra- and inter-generational equity, ethical consumption and attention to serious global crises, including the climate emergency and biodiversity losses.

Agroecology offers a way to overcome these challenges, transform our current food and agricultural systems and restore our relationship with the environment.

Agroecology: restoring balance, enriching lives

The agroecological approach seeks to conceptualize, design and implement productive, equitable and sustainable agro-ecosystems. Agroecology establishes agroecosystems that are not only productive and profitable, but also generate ecosystem services that help sustain human life by, for example, fixing carbon dioxide, supporting beneficial insects and improving the quality of soils.

However, agroecology is not simply a successful mode of production; it is also a way of life with a rich and extensive social and cultural history. As a social paradigm, agroecology provides a way of perceiving, reflecting and being in the world that is rooted in our agrarian reality, enabling us to restore a balanced and reciprocal relationship with nature and rebuild the connections among people, with respect for all living beings. Agroecology supports the establishment and enrichment of flows, cycles and relationships between the components of agroecosystems, the society in which we live and the cosmos, while improving our ability to produce sustainably and leave a promising future to coming generations.

Agroecological production systems are growing all over Latin America today, driven by multiple factors: producers' recognition of the need to establish more sustainable systems and reduce production costs, consumers' demand for healthy food free of pesticide contamination, public policies supporting agroecology as a path towards national food security, and growing awareness of the need for agroecosystems that can adapt to the stresses of climate change.



Agroecology has a rich and extensive history in Latin America. Today these systems are spreading hope across the region, producing healthy food, economic profits, social equity and resilience to climate change. Here, Marcos Calderón of Argentina cultivates corn and squash in polycultures. Credit: Marcela Calderón

N°1 Case Study

Growing food sovereignty and health in Argentina's "Inner Garden"

Between the years 2011–2012, the members of the Calderón family began changing their life. Formerly agricultural producers and contractors, their primary work consisted of sowing seeds and applying chemical fertilizers and pesticides. In 2011, while cultivating 2,500 hectares, they began to realize that each season they had to invest more money for costly inputs, while profits dropped. The soil had become severely degraded due to continuous monocultural production and compacted by the use of heavy machinery. Devoting more time every day to these activities, they felt their quality of life decreasing. They explained:

“We realized that the model of agribusiness agriculture was enslaving us: we were slaves in the latest model 4x4 truck. After nearly 30 years of direct sowing, we realized that this approach was not sustainable, our soil was getting worse, we needed more and more inputs to achieve the same yields, we had lower profitability and we were taking more risks.”

Gradually, the family transitioned to agroecological practice, based on sustainable use of land and water. Located in Baigorrita, Partido de Gral. Viamonte, Province of Buenos Aires, Argentina, the family farm is run by three siblings—Marcos, Patricia and Marcela Calderón—whose aim is to respect nature, as well as its cycles and laws, in order to obtain truly healthy and natural products. The Calderón endeavor seeks to build food sovereignty rooted in the land, while nurturing a mutually beneficial relationship with the environment.

The Calderóns grow organic wheat with white clover, rye grass and fescue, harvesting the wheat to make flour with a hand-made stone mill. As a summer cover crop, they sow forage sorghum with soybeans and in winter, oats with vicia. They utilize ecological pasture management methods, allowing the cattle to move and graze freely in the field, which eliminates need for industrial feed, while regenerating soil quality and biology. Likewise, they manage their sheep with Voisin Rotational Grazing, maintaining about 10 animals per hectare.

While the health of their agroecosystem is improving every year, the Calderón family still faces some challenges, as the restoration of healthy soil biology takes time. The family also faces disadvantages in marketing due to the public's lack of knowledge and the prevalence of misinformation about healthy foods and agroecological production. Nevertheless, they continue to distribute their products, and have had success selling their baked goods at local fairs at more reasonable prices. By eliminating intermediaries between producer and consumer, they are also contributing to local development.

As the Calderóns told RAPAL:

“One of the changes that is new is that in this agroecological model, one works for oneself. In the other model, we were the slaves of a closed system with several masters (the banks, the tax collectors, the sellers of inputs, the marketers). We went from buying 70% of the supplies we use to only 20%. This implies having more independence and freedom to choose and decide.”

Already the family has transitioned 45 hectares of cultivated land to organic farming, with no use of agrochemicals. They consider the physical, chemical and biological aspects of the soil, in order to achieve a living, dynamic, functional system. This fosters a balanced, healthy soil, which means healthy plants, healthy animals and healthy people. Marcela Calderón tells us, “We cultivate health and a living product, which is what really nourishes us. We are a little happier, although we still have not achieved total sustainability.”

N°2 Case Study

Cultivating hope in “Tierra de Sueños,” Costa Rica²

Juan José Paniagua was a young conventional farmer in Zarcero, Costa Rica. He worked in a vegetable producing farm and part of his work consisted of applying pesticides. This task bothered him, both because it produced symptoms of intoxication, and because when he arrived at his home, he carried the odors and residues of the poisons on his clothing, thus exposing his family to the risk of pesticide poisoning.



Agroecological practices such as intercropping and contour farming improve the soil, conserve water and reduce erosion (Tierra de Sueños, Finca Paniagua, Zarcero, Costa Rica)

Credit: Fernando Ramirez

After learning about a Japanese farmer's experience with organic agriculture, the members of the Paniagua family fell in love with the idea and, despite having little money, they ventured to begin farming their own organic parcel. They began their transition to organic farming on a leased property of less than one hectare and later acquired their own farm. However, the soils there had not been well maintained and the farm lacked adequate sources of water. Juan José explains the steps they took to address these problems:

“When we arrived, more than 30 years ago, there were no roads, no fences, no living barriers and the soil was destroyed; we had to have a strategy and carry out practices for the enrichment and conservation of soils. We investigated and shared information on microbiology, organic matter, rocks and minerals and we started working accordingly, improving and maintaining our soil.”

The farm is differentiated by lots, because in each one there are different types of soils.

Currently, the family produces and improves their own seeds and seedlings on the farm they call “Tierra de Sueños” (Land of Dreams). They reserve six hectares exclusively for the production of seeds and different varieties of celery, tomato, sweet and spicy chili pepper, leek, eggplant, lettuce, cucumber, potato, broccoli, cabbage, radish, shallot, zucchini, arugula, coriander, beet and kale, among others. It is the only farm in Costa Rica that produces organic wheat.

Juan José adds, “There is an urban myth that organic agriculture does not give money and that it does not work because crops cannot resist pests without chemicals.” In fact, the Paniagua family has generated \$50,000 in income per year from their greenhouse production covering just one hectare of land. This figure does not include additional income earned from the sale of seeds, seedlings, processed products and other foods produced on the farm, as well as from training courses they offer. The successful experience of the Paniagua family offers inspiration and hope, with the knowledge that together we can build sustainable, healthy and inclusive ways of living that also foster community well-being and solidarity.

N°3 Case Study

Rural women make change, Paraguay³

The United Women's Association was founded in 2012 and is made up of 130 members from various communities of Santa Rosa Misiones, 250 km to the south of Asunción, Paraguay. These women experience common challenges of the rural sector, including poverty, precarious production conditions, food insecurity, gender inequities and a lack of knowledge of their rights.



Women implementing agroecological practices in Paraguay discover a path towards food sovereignty for their communities, with increased income, improved family nutrition and health and greater gender equity. Credit: Mario Paredes

The women joined together to promote actions aimed at improving family farming, producing agroecologically for their own consumption as well as for local markets, while seeking economic and social empowerment within the framework of a rights-based approach.

The Association addresses different aspects related to the women's practical needs and strategic interests. In coordination with local governments, the Association is able to influence and achieve articulation of its priorities in local public policies, as well as institutional support on issues relating to gender, management of productive projects and commercialization. The Association receives technical support from the NGO “Alter Vida,” in coordination with the Ministry of Agriculture and Livestock.

The fundamental basis of the organization is food sovereignty, and for this, the women grow vegetables, plant trees for fruit, medicinal uses, energy and other environmental benefits, raise animals, and produce food for their own consumption such as corn, peanuts, beans and cassava, assisted by their husbands, sons and daughters. The women apply agroecological practices such as composting, intercropping and companion planting, rotating crops, botanical preparations for natural pest control, recovery of native seeds, among others. They sell the products in their own local markets and in street fairs in the urban center of Santa Rosa.

The experience of these women with agroecology has been deeply enriching. Not only have they benefited in productive and economic aspects, but they have developed their capacities as well, increasing their self-esteem, recognition and leadership within the family and community.

Recommendations

We are at a crossroads, in a culminating moment of humanity, in which we must discuss, review and rethink what we conceptualize as development. With humanity facing an immense ecological crisis today, we must take steps to leave behind the destructive chemical-intensive methods of agriculture and complete our social, economic, ecological and cultural transformation towards agroecology. With this in mind, we can identify the policies, instruments and practices to achieve our goals, and the indicators to assess our progress.

Concrete actions to overcome the challenges facing Latin America and support the growth of agroecology in the region include:

Establish a strong, enabling policy environment

- Strengthen national, regional and global regulatory frameworks to enable health-protective, environmentally sound management of chemical products throughout their life cycles;
- Enact policies and measures such as providing incentives, capital, credits and subsidies for ecological production while removing perverse incentives that continue dependence on chemical-intensive production systems;
- Develop a comprehensive proposal for the transformation of agricultural

systems with the participation of different state institutions, producer organizations, consumers and civil society organizations;

- Through FAO and International Conventions such as the Rotterdam and Stockholm Conventions and the Strategic Approach to International Chemicals Management (SAICM), promote the generation of a global framework, with technical assistance and public access to information about both the hazards of chemical pesticides and the availability of alternative agroecological systems, to facilitate the replacement of chemical-based agriculture with agroecological strategies and practices;
- Create political space for meaningful public participation in the development and implementation of policies at different jurisdictional levels to create the enabling conditions for a transition to agroecology.

Ensure secure access to necessary resources

- Provide stable, predictable and accessible financing to all stakeholders to achieve the strategic objectives of reducing reliance on chemical products and support the transition to least-toxic, ecological approaches;
- Invest in local and regional development scenarios to meet the food, economic and social needs of rural and urban communities, enabling

different actors to participate in a complementary way that matches the availability of their resources, capabilities and know-how;

- Remove barriers to resources that producers seeking to establish agroecological systems face, such as obstacles to obtaining secure access to land, water and seed.

Establish alternative markets

- Encourage the development of alternative markets for agroecological products. This will facilitate a shorter transition process and also encourage new actors to enter agroecological production. Empirical evidence indicates that the development of local markets facilitates producers' ability to obtain adequate income and provide healthy high quality food for consumers;
- Facilitate the establishment of participatory guarantee certification systems that build trust between producers and consumers.

Notes

1. Alavanja, M.C.R., J.A. Hoppin and F. Kamel, (2004). Health Effects of Chronic Pesticide Exposure: Cancer and Neurotoxicity. *Ann Rev Public Health* 25:155-197.
2. Ing. Agr. Fernando Ramírez. IRET, Costa Rica / RAPAL- IPEN
3. Ing. Agr. Mario Paredes, Project Coordinator, Alter Vida. Asunción, Paraguay / RAPAL – IPEN



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