

EDITORIAL

AGROECOLOGY AS A TRANSFORMATIVE TRANSDISCIPLINE

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This special issue is remarkably timely. In September 2014, the FAO hosted its first ever symposium on agroecology. Since then, diverse sectors have gathered at several regional meetings to assess opportunities and constraints for agroecological development. Agroecology is increasingly invoked in laws and programs from the local to the national level, particularly in Latin America and Europe. It is now discussed on the international stage as a solution to a suite of inter-related, thorny challenges that include hunger, the epidemic of diet-related disease, rural poverty, biodiversity loss, environmental contamination, and climate change.

Agroecology is often described as practice, science, and movement. The foundation of agroecological practice is traditional agriculture and continuous innovation by farmers themselves. More recently, and particularly over the last half century, agroecological science has emerged as a response to the human and ecological toll of the hegemonic, industrial capitalist model of food production and distribution. Using agroecological approaches, scientists have made significant contributions to diverse fields within the natural sciences, including community and landscape ecology, epidemiology, microbiology, human nutrition, and climate science. But agroecological science also challenges disciplinary boundaries and conventions, engaging in action research using innovative methodologies. Horizontal dialog among farmers, scientists, and others committed to agroecological innovation and the defense of related cultural, spiritual, and ecological values has laid the groundwork for progress in Latin American agroecology. The most significant manifestation of agroecology as a movement is its adoption by the international peasant movement, particularly La Vía Campesina (LVC) and a range of allied social movements from around the world (<http://www.foodsovereignty.org/forum-agroecology-nyeleni-2015/>). For these movements, agroecology is essential to the realization of food sovereignty, a central objective of their struggle over the last decade (<http://nyeleni.org/spip.php?article290>).

A new set of challenges arises as agroecology joins the mainstream. Advocates worry that, as has often happened to the organic movement, the essence and complexity of agroecology may be lost in the translation to policies and programs with short-term, technical agendas. This collection of articles addresses the challenges inherent in embracing and communicating the complexity of agroecology as it broadens its geographic and cultural reach.

Lacey describes a research agenda for agroecological transformation and food sovereignty. Citing the failure of industrial food systems to end hunger, he argues that we have a moral imperative to undertake empirical research to assess the often-heard affirmation that no viable alternatives exist. This means engaging with the multiplicity of strategies for agroecological production and distribution to understand their potential and limitations. One facet of this work brings the technical tools of fields like soil science, microbiology, genetics, and plant physiology to bear on particular elements of agroecosystems. However the broader research program must be contextualized and interdisciplinary, fully embracing the complexity of interactions that characterize ecosystems and foods systems. Rather than assuming the role of expert advisor, scientists must join in horizontal dialog with farmers and other knowledge holders, bridging cultural and language gaps. In order to become transformative, agroecological science must itself be receptive to transformation via its engagement with farmers and movements. Another essential task is to understand the social and economic conditions necessary for scaling out agroecological practice and the distribution of agroecological products. Researchers can contribute to development of methods and organizational strategies that are applicable with new participants and in novel environments, particularly in big cities.

Rosset's contribution is a far-reaching overview of the origins, methods, and goals of the agroecological pedagogy that is emerging from Latin American rural movements. Within the Coordinadora Latinoamericana de Organizaciones del Campo - LVC's continental coalition - disparate organizations engage in construction of a collective, political vision of agroecology as a tool for "defense, (re)configuration, and transformation into campesino territories." These ongoing conversations employ the philosophy and methodology of diálogo de saberes; collective reflection that gives rise to new knowledge and meaning while remaining grounded in identities, histories, traditions, territories, experiences and processes of each group. Campesino (peasant), indigenous, and rural proletarian member groups have fundamentally different ways of organizing themselves and of sharing knowledge, different

motivations for their struggles and different sources of affinity with agroecology. Yet a shared pedagogical approach is emerging from within the movement that draws elements from each of these sectors. Diálogo de saberes and horizontal knowledge sharing is one common element, particularly in the context of farmer-to-farmer exchanges. In formal school settings, such as those associated with Brazil's Programa Nacional de Educação na Reforma Agrária (PRONERA), time is dedicated to community and organizational as well as classroom work. Other common elements across settings include: emphasis on self-management and collective organization; holistic integration of technical and political considerations; a humanist, internationalist, and distinctly Latin American vision that cultivates respect for Mother Earth and right livelihoods (*buen vivir*); formation not of experts, but of facilitators of processes of political and agroecological transformation; and a fundamental role for agroecology in the construction of food sovereignty, territorial autonomy, and collective transformation of rural life.

Fonseca Sousa traces the history of Brazil's agricultural extension system in order to contextualize and analyze a proposed new model for extension, *Construção do Conhecimento Agroecológico* (Construction of Agroecological Knowledge; CCA). The rural extension system, founded in 1948 with US support, was based on reductionist science and a unidirectional, authoritarian knowledge diffusion model that discounted popular, traditional, and indigenous knowledge. Extensionists used behaviorist pedagogy, rewarding good performance with credit and social recognition. Federal control increased in the 1970's and farmers became increasingly dependent on technical "packages" including seed, chemical inputs and irrigation. Regional specialization and subsidies encouraged extensive, mechanized, export-oriented monocultures. Social consequences of this "green revolution" included concentration of land ownership and an exodus of rural families to urban centers. Beginning in the 1980's, social movements and NGO's promoted alternative development models, but their extension strategies echoed those of the government system. A countercurrent emerging in the 1990's began building an alliance in support of family farming, and with the change in government in 2003, a new extension policy brought participatory methodologies and agroecology to the fore. Unfortunately, most extensionists, trained under the old model and still subject to the rigid hierarchies of federal agencies, hold fast to their *modus operandi* of promoting technical knowledge by negating popular knowledge. The CCA approach would cultivate relationships and collective learning processes that foster the agency necessary to build projects according to local needs and

aspirations. Diálogo de saberes among diverse actors and between empirical and scientific knowledge is the fundamental tool used by CCA to promote a broad transition to agroecology. A wealth of proposals and collective action, including new epistemological, organizational and development models, would emerge from interactions among participants. In concordance with Lacey's vision, the CCA model would also transform the role of scientists and technicians. In supporting these processes rather than driving them, they must embrace complexity, diversity, equality, sustainability, solidarity, and territorial sovereignty.

Alemán's synthesis of decades of scientific research and rural development programs in Mexico's Chiapas Highlands elucidates the mismatch between scientific and indigenous epistemologies, and identifies potential for mutual understanding. Tsotsil Maya knowledge production manifests itself in traditional agroecosystems, particularly the milpa (polyculture where maize is the principal crop) and sheepherding. Knowledge arises through the daily experience of interactions among production systems, community life, and natural systems, as well through intentional experimentation. Traditional knowledge tends to be empirical, utilitarian, and context dependent. By contrast, scientific knowledge aspires to be objective, ahistorical, and transcultural. Traditional knowledge tends to be holistic, while scientific knowledge is reductionist. Indigenous knowledge has been more effective than government programs at providing immediate solutions for Highland farmers. Scientific understanding could aid in understanding underlying mechanisms and identifying problems early on. However government programs and the technicians working for them have failed to engage with local knowledge and realities and their efforts to alleviate poverty and marginalization of indigenous communities have had little impact. Echoing Lacey, Sousa and Rosset, Alemán calls for a more holistic, contextualized approach, in which scientific and local knowledge meet as equals, local capacities are strengthened, and endogenous processes are supported and systematized.

Piasentin analyzes efforts for agroecological transformation in three Movimento Sem Terra (Landless Rural Workers' Movement; MST) settlements founded in Rio Grande do Sul, Brazil in the late 1980's and early 1990's. The MST promotes agroecology as the production model most congruent with the goals of food security, autonomy, and endogenous development. Specifically, the MST expected settlers to prioritize subsistence production and activities providing a fairly constant income stream, to produce their own seeds, and to avoid external inputs, particularly genetically modified (GM) soy seed. The MST was successful in mobilizing government support for access to land and credit, and, in some cases,

infrastructure and marketing. They also substituted agroecological inputs and practices for some chemical fertilizers, herbicides and pesticides. However several bottlenecks impeded full implementation of its agroecological agenda. First, as Sousa and Alemán also describe, technicians trained with green revolution technology and ideology do not shift easily to an agroecological focus. When this fieldwork was conducted in 2002, schools and universities still taught “an authoritarian working methodology and a technical content non-compatible with the reality of family farmers” (it’s worth noting that this is beginning to change, thanks in part to MST and LVC efforts (e.g. Meek 2015)). Second, while agroecology promotes diversified production, in part to assure food security and more constant income, the MST was not unable to arrange favorable markets for many of the settlers’ products. Third, given the regional dominance of the industrial production model, many settlers used GM soy and hybrid corn seed, despite MST opposition.

Together, these articles paint a portrait of agroecology as a vibrant transdiscipline, bridging diverse epistemologies to address many of our most pressing social and environmental concerns. They highlight particular strengths of Latin American agroecology, specifically social movements as sources of theory and methodology, diálogo de saberes, and the fundamental role of local and traditional practice in knowledge production. They also point out several constraints on agroecological development, including the continued dominance of the industrial capitalist system in shaping markets, policy, and programs. Large-scale agroecological transformation will require the formation of generations of scientists and technicians with a holistic view of agroecosystem and food system complexity. Among their most essential traits will be the humility necessary to play a supporting role in social movements and to join in the co-creation of knowledge with people of diverse backgrounds and experiences.

References

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