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Editorial: Agroecology in policy and practice

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Editorial on the Research Topic Agroecology in policy and practice

In the past years, there has been steady growth in research and work relating to agroecology. People-centered, knowledge-intensive, and rooted to sustainability, it is now well-established that agroecology's holistic approach matches the transformation to food systems called for by the 2030 Agenda; a transition to sustainable food and agriculture systems that ensures food security and nutrition for all, provides social and economic equity, and conserves biodiversity and the ecosystem services on which agriculture depends. Although not a new concept, agroecology is gaining interest worldwide among a wide range of actors as an effective answer to climate change and the interrelated challenges facing food systems, finding expression in the practices of food producers, in grassroots social processes for sustainability and in the public policies of many countries around the world.

While agroecological elements have been applied and honored by communities for centuries, they have rarely received much respect in the intergovernmental and scientific communities until fairly recently. Regional networks such as SOCLA in Latin America, Alliance for Food Sovereignty in Africa and the Asian Farmers Association for Sustainable Rural Development in Southeast Asia increased interest, practice, and support for agroecology. At the international level, the process for a food system transformation started with the International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD)- a UN initiated process calling for agroecology. Two international symposia convened by the Food and Agriculture Organization of the United Nations, multiple regional symposia, the adoption of the Ten Elements by FAO's governing body, and the commissioning of the High Level Panel of Experts report to the World Commission on Food Security on "Agroecological and other innovative approaches for sustainable agriculture and food systems that enhance food security and nutrition" among other initiatives further demonstrate that Agroecology has landed on the global agenda.

In recognition of this, the World Futures Council 2018 Future Policy Award was dedicated to recognizing policies that scale up agroecology, contribute to the protection of life and livelihoods of small-scale food producers, ensure sustainable food production systems, and implement climate resilient agricultural practices. As a follow up, WFC facilitated this special issue of Frontiers in Sustainable Food Systems on "Agroecology in Practice and Policy." The aim of this Research Topic was to gather contributions from scientists and practitioners working in diverse disciplines who have common interests in agroecology policy and practice. We asked for examples contributing to the protection of the life and livelihoods of small-scale food producers

and empowering them, nurturing sustainable food production systems, promoting resilient agricultural practices that help maintain ecosystems, strengthening capacity for adaptation to climate change, and progressively improve land and soil quality. An overarching goal was to demonstrate the breadth of agroecology policy and practice, and foster understanding between different scientific communities who may not always be aware of one another's work. We looked for contributions about policy and practice examples that would inform about the opportunities and challenges of agroecology as well as entail a set of recommendations for a range of stakeholders (policymakers, academia, NGOs, international organizations, etc.) on what has to be done, in order to scale up agroecology in that particular context. Furthermore, we were interested in methodologies to identify and evaluate agroecology policy and/or practice examples.

Under the umbrella of this Research Topic, a total of 13 articles were published. We were open to a wide variety of types of articles. Amongst them were mostly Original Research (6), but also articles on Methods (1), Hypothesis and Theory (2), Policy & Practice Reviews (1), Reviews (2), and Systematic Review (1). We elaborate on the different types of articles published and provide more detailed description of a few of them below.

A good number of articles examined public policies and their impact, such as the one on *Brazil's semi-arid region* (Brandão et al.) or those on the *Ecuadorian capital Quito* (Rodríguez et al.) and *Los Angeles in the US* (Daniels and Delwiche). Both cities have stepped up their work for agroecological urban agriculture and food resilience and their policies in this regard were honored with the Future Policy Award 2018 of the World Future Council, FAO, and IFOAM-Organics International. Struggles at different levels shape these public policies, from local arenas to national and the international food policy arena. As the article on “*the innovation imperative*” well-exemplifies, often disputes occur at the level of discourse (Anderson and Maughan). As can be anticipated by the advancement of a system of food and farming that challenges the conventional model of high-input production—even if this is showing many weaknesses, Agroecology has met with considerable forces to push back and reshape its key concepts. As articulated in the article by Anderson and Maughan, as the transformative concept of Agroecology has entered mainstream discursive arenas such as intergovernmental fora, it has been subjected to an “innovation frame,” which poses a number of issues not just for Agroecology, but for sustainability transformations in general. This insightful article—analyzing the discourse around public comments—is very helpful in parsing the complex dialogue around an ultimately political and social—as well as agronomic—topic.

Another set of articles researched agroecology practices, their benefits and challenges to implementation, such as the significance of *long-term nutrient management in an intensive rice-wheat cropping system for soil sulfur* (Meena et al.). Articles are available on *the complexity of smallholders' intense use of glyphosate in maize crops from South Mexico* (Monroy-Sais et al.) or on benefits of *decentralized wastewater treatment for rural villages in India* (Friedrichsen et al.). One of these takes a particular farming system as a point of departure: Freed et al. focus on the *importance of maintaining diversity of integrated rice and fish production*, a production system in Asia with tremendous scope for holistic approaches.

A focus on strong local food systems, conferring diversity and circular economies on communities, is central to agroecological

approaches. The article by Heindorf et al. illustrates the substantial contribution of local food markets to maintaining agrobiodiversity in region of Huasteca Potosina, Mexico. Yet the skewed proportion of markets fostering such biodiversity points to the need for political action to maintain and promote this diversity into the future.

Last but not least, a third set of articles are dedicated to research methods for evaluating agroecology. One of the expected responses to a system that challenges the status quo is to ask for more evidence of its performance. Evidence of agroecological approaches has been well-documented in its many beneficial aspects, including environment, food and nutrition security, and households' incomes, all the more remarkable in the face of the reality that research into agroecology has been consistently underfunded (Biovision Foundation for Ecological Development and International Panel of Experts on Sustainable Food Systems, 2020). Nonetheless, performance evaluation has been one of the requests on the intergovernmental level, in particular from the 26th Committee on Agriculture of the United Nations Food and Agriculture Organization (COAG, 2018). Recognizing that this request provides an opportunity to compile global, multi-scalar, and multi-dimensional documentation in a format that can be used to inform policy-making processes, 70 representatives of agroecology-related organizations worldwide worked together to respond to this need. The article by Mottet et al. in this special issue documents the process undertaken to develop such a tool, called “TAPPE: Tool for Agroecology Performance Evaluation.” One can only hope that initiatives to develop such metrics—such as the newly-launched CGIAR Program on Agroecological Transitions Program for Building Resilient and Inclusive Agricultural & Food Systems—will build on this well-elaborated foundation (CGIAR, 2023).

The research focused articles in this special issue argue for *a new understanding of the centrality of agroecosystem actors and their capacity for agency* (Gallardo-López et al.), and for *the need of long-term participatory action research (PAR) in agroecology* (Sachet et al.). One can find practical recommendations, which requires addressing specific questions in research, technology, and policy development. The article by Tittonell et al. on *how to mainstream agroecology among large scale farmers* makes the point that large scale conventional/industrial farming uses 70% of the agricultural land area, and therefore cannot be ignored as a huge potential for transformation toward agroecological practices. Given the amount of subsidies that this sector received, it presents an opportunity to redirect these subsidies toward the transformation and achieve many objectives that relate to the conservation and promotion of biodiversity, with nature inclusive agricultural landscapes that re-establish ecosystem services, and manage water and nutrient cycles. Such an agroecological redesign requires a change in policies along the entire value chain, backed by a new research agenda that will address the farmers needs for the deep system transformation.

In sum, this special issue provides in-depth analysis of a range of policies, practices and research methods which support agroecology in many regions around the world, further opening the space for agroecology. Looking forward to more research on this topic, we are thankful to all contributors and especially toward Frontiers, guiding us through the rigorous scientific peer-review selection process.

Author contributions

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

Conflict of interest

CB was employed by Food and Agriculture Organization of the United Nations (Italy). HH was employed by Millennium Institute.

The remaining authors declare that the research was conducted in the absence of any commercial or financial

relationships that could be construed as a potential conflict of interest.

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