ENJEUX SCIENCES

DESERTIFICATION AND CLIMATE CHANGE

ARE THEY PART OF THE SAME FIGHT?

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WHY ARE AGROECOLOGY-BASED SOLUTIONS IMPORTANT?

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Agroecology emerged in the early twentieth century and has developed within a rural context across the world. It has become more visible over the last twenty years and more widely accepted in scientific, agricultural and political discourse. The meanings, definitions, interpretations and approaches of this dynamic are ever evolving, making it difficult to establish a single, precise explanation of what agroecology is. But recent efforts have sought to better define the various aspects of this extensive approach, which seeks to better harness ecological processes for agricultural production and lessen dependence on chemical inputs in ways that are economically and socially sustainable and equitable. The FAO's ten elements of agroecology or the thirteen principles of agroecology described by the High Level Panel of Experts on Food Security and Nutrition (HLPE-FSN) illustrate the array of technical, organizational and sociopolitical actions and scales of application that agroecology can leverage. Agroecology is relevant to efforts to combat desertification in many ways.

Making efforts to combat desertification a key part of sustainable development

The holistic approach – which assumes that ecosystem health underpins human well-being, production system performance and social ecosystem resilience – makes agroecology a powerful lever at the point where many sustainable development objectives overlap. Applying agroecological practices and techniques to better manage resources and ecological processes through biodiversity has consequences not only for the three indicators used to assess land degradation (i.e. soil carbon stock, land productivity, vegetation cover) but also for the fight against poverty, hunger, biodiversity loss, desertification, climate change mitigation and adaptation, and the availability and quality of water resources.

Organic matter management, for example, is a key part of agroecology. In dryland areas, good management helps to reduce wind and water erosion by improving soil structure, reducing evaporation by storing water in the soil, increasing bacterial life by improving fertility, etc. Similarly, diversifying cultivated species supports better use of available resources through their complementarity, and facilitates the natural regulation of pests and diseases by stimulating biodiversity.

Agroecology also resonates at the community level in the proposals made by the people and managers of areas affected by desertification who are exploring innovative agroecological solutions. In Niger, agroecological practices have helped to combat land desertification by attempting to create urban–rural complementarities that did not exist before (e.g. recycling household waste in cultivated fields) or by giving more land rights and access to women farmers and agricultural processors.

A step-by-step transformation of production systems to fully address needs

Agroecological practices and techniques support an incremental transformation of production systems, avoiding the difficulties often encountered with disruptive change. Pathways that lead to a complete conversion of current systems towards entirely agroecological systems are possible, such as those described in Steve Gliessman's (2016) work. These transitions then go through a series of levels of change, each enabling the transformations to be targeted and monitored, and supported by clear actions.

In dryland areas, these steps must be adapted to conventional systems where chemical inputs are not a major issue, since low water availability limits their effectiveness. This intensification is based on the gradual adaptation of practices to better control soil degradation, capture rainwater, reintroduce biodiversity and stimulate ecological processes.

Agroecology does not offer a generic, universal solution that can be applied to any situation. It is above all an approach where ecological, economic and social principles are applied to support the sustainability, viability, resilience and coherence of the system

as a whole. Agroecological systems are developed progressively, depending on the context and needs or urgent issues to address. Each of the principles may be favoured to a varying degree so as not to upset the balance of the entire system. In farming systems, agroecology leads to the participatory design, creation and adaptation of complex cropping systems that are productive and therefore attractive despite an unfavourable environment and very low input use.

Easier said than done

Agroecology practitioners face resistance and conflict throughout the value chain in production, processing and marketing systems.

At each stage of the transition, they decide which changes to implement and at which scale with a view to making the new systems compatible with a number of constraints, knowing that not all of them can be perfectly resolved at once. This means that producers must prioritize limitations and make compromises in dealing with them. These compromises are often related to the degree to which the different principles of agroecology are applied, which must be adapted to the resources available to producers. Each stage should enable simultaneous changes to be made to the internal or external conditions of farms, so that the next stages of adaptation can be put in place. It is an arduous process, requiring continuous collaboration with different producers who do not all have the same conditions or resources. Getting women, young people and the most marginalized populations involved is often crucial to ensuring an effective and equitable transition. Stakeholders must also work with the institutions that influence the economic, social and political context in which these producers work, in order to create more favourable conditions for agroecological transitions on farms.

Knowledge-based solutions

The joint production and sharing of information play a central role in the development and application of agroecological innovations. Science has joined the field of agroecology to provide valid options for the agricultural transition. However, the critical

mass of existing know-how has mainly been produced in farming environments. Building on this foundation, the key challenge is to continue producing new knowledge through joint efforts by the various stakeholders to adapt new agroecological systems to the wide range of conditions faced by small-scale family farmers. It is also extremely important to be able to make a better scientific assessment of the potential of existing agroecological systems so they can be improved by the players involved, and thus share useful insights with institutional decision makers and policymakers. Similarly, it is vital to capitalize on all this knowledge and share it as broadly as possible, especially with stakeholders in dryland areas who are sometimes isolated and powerless to find suitable solutions to the issues they face.

USING EVALUATION TO SUPPORT ADVOCACY

"There is sometimes a degree of scepticism about the relevance of agroecology in meeting today's challenges. This reticence runs through the agricultural world as well as that of decision makers. [...] Systematic references produced using a solid, common methodology are still lacking. Yet there is a growing demand for reliable, 'aggregatable' data on the effects and development conditions of agroecology from policymakers, farmers and development support stakeholders" (Levard, 2023; translation by the authors).

Three methods for evaluating agroecology, its agroenvironmental and socioeconomic effects, and the conditions for its development have been recently designed and tested by development practitioners, researchers and teacher–researchers in different areas in the Global South: the method presented in the FAO's Tool for Agroecology Performance Evaluation (TAPE), the method proposed by the Working Group on Agroecological Transitions (known by its French acronym, GTAE) and the method developed by the AVACLIM[12] project. These methods help fill this gap.

12. https://avaclim.org/le-projet