



# Implementing agroecology through soil protection

## BACKGROUND



Soil, which takes centuries to form and is therefore considered a non-renewable resource, is vital for plants and countless organisms. It serves as the basis for agricultural production and the main source of income for farmers worldwide.

Currently, about one third of global soils are degraded, meaning they are no longer performing their natural functions such as regulation of water, recycling of nutrients, habitat provision, carbon storage, etc. Without urgent action, global soil degradation could rise to 90% by 2050 due to unsustainable agricultural practices and climate change. At the same time, food production will need to double by 2050 to meet the growing demand.

Agroecology is an integrated and holistic approach to sustainable agricultural and food systems, from production to consumption. It is pursued in three dimensions: science, agricultural practices, and a social movement. The [13 agroecological principles of the HLPE \(2019\)](#) provide guidance for its implementation.

## Potential of linking agroecology and soil protection

Soil protection and rehabilitation (SPR) measures combat and prevent soil degradation by restoring soil fertility and functions in degraded areas and maintaining or increasing the productive capacity of healthy soils through sustainable practices. It also enhances the role of soils as carbon sinks, as CO<sub>2</sub> remains sequestered in the soil through the long-term incorporation of organic matter, offering significant potential in the fight against *climate change*.

SPR is integral to agroecology, with nine of the 13 agroecological principles building directly or indirectly on soil protection (see Figure 1, principles 1 – 7, 9 & 12).

Implementing SPR within an agroecological framework increases yields, raises incomes and diversifies food supplies, making smallholder farmers' more resilient to climate change and fluctuations in the agricultural supply chain.

The holistic approach of both concepts offers perspectives at different levels: for producers, consumers and local communities who can help shape the future of their agri-food system, but also for supra-regional food systems. In this way, agroecology is an important building block for the sustainable transformation of agri-food systems that can halt soil degradation and make a significant contribution to improving food security for millions of people.



Agroecological model farm in the lowlands of Ethiopia, © GIZ / Climax Film Production

### THE GLOBAL PROGRAMMES ProSoil AND Soil Matters IN BRIEF

As part of Germany's Special Initiative "Transformation of Agricultural and Food Systems", the Global Programme "Soil Protection and Rehabilitation for Food Security" (ProSoil) supports and advises smallholder farmers in Ethiopia, Benin, Burkina Faso, India, Kenya, Madagascar and Tunisia on agroecological and climate-smart agricultural practices with a focus on sustainable land management. Stakeholders from the scientific community, civil society and the private sector are actively involved in the activities, in addition to the relevant government agencies in each country. Since the launch of ProSoil in 2014, soil degradation has been reversed on more than 981,000 hectares of land. This has resulted in an average yield increase of

44 percent, directly benefiting the livelihoods of more than 2.6 million people. More than 65 percent of the farmers reached are women. Through climate-smart soil management solutions, the carbon footprint has been reduced by around 1.74 million tonnes of carbon dioxide, as healthy soils are an important carbon sink. The Global Programme "Soil Matters – Innovations for Soil Health and Agroecology", launched in 2025, builds on the results of ProSoil and aims to develop and promote agroecological innovations in partnership with the private sector to scale up impact and support agricultural transformation processes. Soil Matters is active in Tunisia, India, Kenya, Ethiopia, Madagascar and Cameroon. Both Global Programmes, ProSoil and Soil Matters, are commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ) and co-funded by the European Union (EU) and the Gates Foundation.

## APPROACH AND RESULTS

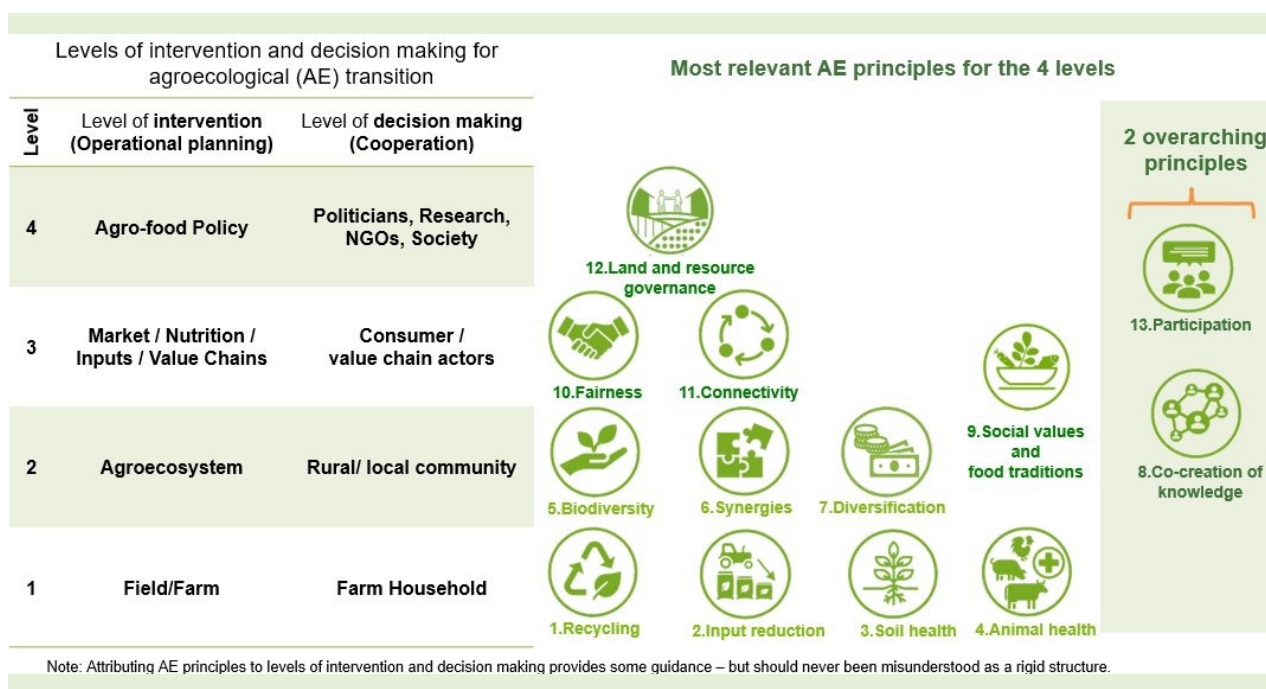
### Challenges in soil health and agroecology

As the backbone of many African economies, agriculture is crucial for growth in other sectors such as manufacturing and services. With a significant portion of the population living in rural areas and engaged in farming, raising agricultural incomes is essential for reducing poverty, boosting prosperity, and creating jobs, especially for women and youth. However, current agri-food systems face significant challenges due to climate change and

other stresses, resulting in ecosystem degradation, loss of water availability, and soil degradation, while exacerbating social inequalities.

The agroecological approach is effective but requires extensive awareness raising and attractive incentives for widespread implementation, involving stakeholders at all levels. Agroecology is a broad concept that varies from context to context. In India, for example, it is often referred to as natural farming. Therefore, context-specific cooperation and knowledge sharing are crucial for its global implementation.

**Figure 1:** The 13 agroecology principles assigned to the intervention and decision-making levels in ProSoil (the assignment of the 13 principles serves as a guide and is not static), GIZ (2022)



### Overcoming the challenges of soil protection through agroecology

Agroecology as a concept has established itself as an effective long-term strategy and has been anchored as a guiding principle in German development co-operation, including in the BMZ core strategy “Life without Hunger – Transformation of Agricultural and Food Systems”, the coalition agreement and the European “Green Deal” since 2020. In addition, the German government has been a member of the

“Agroecology Coalition” since June 2023, in which 55 countries and more than 270 organisations are committed themselves to an agroecological transformation of the agri-food system.

The holistic approach of agroecology, as an interplay of agricultural practice, scientific knowledge and socially inclusive movement, enables concrete long-term solutions at socio-economic and environmental levels. It emphasizes locally proven knowledge and site-specific adaptation of interventions, promotes the participation



and empowerment of women and youth by ensuring access to resources and markets, and establishes direct links between producers and consumers.

As a systemic approach, agroecology offers various starting points for implementation in the Global Programme. All 13 agroecological principles are applied to varying degrees. ProSoil focuses on the level of farms, agroecosystems and agricultural policy.

At **field/farm level**, for example, nutrient cycles are maintained or restored through sustainable agriculture.

At the **agroecosystem level**, for example, urban and rural communities work together to return nutrients to rural areas by using urban compost. Community involvement in watershed management promotes the use of synergies within agroecosystems and restores cycles within them.

Action is also being taken at **market level**, for example by supporting Beninese start-ups to develop and market agroecological solutions.

At the **policy, institutional and social levels**, the project aims to improve the framework conditions for the sustainable mainstreaming of agroecology and SPR by creating policies and economic incentives for sustainable business models – such as the production of compost, seeds or biochar – and by providing the necessary advisory services. For example, in Ethiopia, economic evidence on farm-level soil liming led to the establishment of a privately managed value chain. Integrating agroecology and SPR into the curricula of agricultural colleges, universities and advisory services will disseminate proven solutions. As a global project, learning from individual countries is being processed, shared internationally, and incorporated into global agendas and networks.



Field trip during the closing workshop of the Agroecology Leadership Academy in Ethiopia, © GIZ / HB Visuals

## Outcomes

### Selected effects of ProSoil

#### **Agroecological soil remediation measures shorten production routes and increase water availability all year round – example from the lowlands of Ethiopia:**

The Dry Valley Rehabilitation and Productive Use Approach (DVRPU) increases the amount of groundwater locally, making drinking water available to humans and animals for longer periods of the year. Livestock no longer have to travel as long and as far as before in search of pastureland, as families are now able to produce the feed using cut-and-carry methods.

- **Impact:** Biomass production increases 3 to 4 times overall on the protected and/or rehabilitated areas. In addition, the health and milk yield of the livestock increase.

### Agroecological principles

The Soil health, Animal health, Land and Resource Governance, Recycling



#### **The participatory approach “land rights first” approach (fr. *le foncier d’abord*) gives farmers unprecedented planning and production security – example from Burkina Faso:**

By accompanying and supporting village communities in the establishment of so-called “*Commissions Foncières Villageoises*” (Engl. “Village Commissions for Land Ownership/Land Rights”), local agricultural institutions, and in particular women’s associations, are enabled to have their land rights entered in the land register and to clearly distribute the responsibility for management within the village community.

- **Impact:** Approximately 30,000 hectares of land were provided with land rights. In addition, 72 land ownership authorities set up or renewed. As a result, 82% of the conflicts were resolved.

Land and Resource Governance, Fairness, Participation



#### **Agroecological measures as gender-transformative approaches to gender equality – example from Benin:**

Training for women on the production and marketing of biochar and terra preta with support in business planning.

- **Impact:** Around 85% of the 41,500 women who apply soil protection have improved their yields by more than 50%. 69% of women in 56,000 households said they had a greater say in family decisions about which crops to grow.

Diversification of income, fairness, social values and diets, Soil health, Synergies



#### **Upscaling of agroecological practices through the “relay farmer” approach – example from Madagascar:**

SPR and climate-smart techniques are shared widely through peer-to-peer learning formats.

- **Impact:** Until 2024, a total of 69,000 farmers benefitted from the peer-to-peer learning formats. In 2023, the implementation partners in the Boeny region confirmed SPR application on a further 3,000 ha from smallholder farmers who have learned from their neighbours but have not received any help directly from relay farmers, indicating an additional spill-over effect of the approach.

Soil health, Synergies, Co-creation of knowledge, Social values and food traditions





## Example from the implementation: The Agroecology Leadership Academy

From 06/2021 to 03/2025 the Action called “ProSilience” was embedded into the Global Programme ProSoil. This Action was jointly co-funded by the European Union (EU) and the German Federal Ministry for Economic Cooperation and Development (BMZ) within its special initiative “Transformation of Agricultural and Food Systems” and implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH as a contribution to the EU initiative “Development of Smart Innovation through Research in Agriculture” (DeSIRA). This co-funding focused on agroecological transition towards resilient agrifood systems.

As one of several cross-country activities ProSilience launched the “Agroecology Leadership Academy”, a peer-learning and capacity-building programme across

all seven ProSoil partner countries to strengthen and further build up upon leadership in Agroecology. 38 Participants (45 % were female) – selected for their diverse backgrounds in gender, age, and expertise in research, public and private sector – have enhanced their leadership skills, fostered sustainable knowledge networks, and strengthened agroecological initiatives. In between the online and two physical meetings, the country teams have developed a prototype of their transformation initiatives for their specific context. All have been presented during the closing session in Ethiopia. The network and mutual learning developed through the Academy helped strengthening and further equipping participants with the necessary knowledge and methods to serve as positive examples of leadership in Agroecology. All materials, recordings and videos of the country-specific Transformation Initiatives of the Academy are available at [Agroecology TPP](#), you can also find a summary [here](#).



Participants of the Agroecology Leadership Academy at the closing workshop in Ethiopia, © GIZ / Eden Teferi

## TESTIMONIAL

### Suresh Renge, Mangi (Yavatmal, India): 5-acre

“When I think back the way we farmed before this project came to our village, I am disgusted by our ignorance. Small improvements, a little bit of scientific knowledge and actual field trials – it all goes a long way. I have been applying techniques supported by ProSoil for four years; I started with one acre of my farm and now, apart from a few chemical applications for the cotton crop, I have gone completely organic farming with all the other crops we grow here – soybean, green gram, wheat, chilies and perishables. This year, I got best yield for soybean grown on vermicompost, nearly 11 quintals for a bag of seeds I used, or eight quintals for an acre. This year, some of us are also testing biochar. Soil health has certainly improved, and if biochar proves useful, it will be a boom! Farmers from in and around my village visit my farm to see the results. I want to improve these techniques.”



Production of biochar in Mohgaon, Dhule district in the state of Maharashtra, © GIZ

## Key Messages

- Raising the potential of SPR through agroecology leads to sustainable agricultural production and is a cornerstone of climate change mitigation in agriculture. SPR is agroecology and agroecology does not work without it.
- Agroecological soil conservation practices enable farmers to produce their own inputs, reduce the need for expensive external inputs and imports, and increase resilience to crises.
- Agroecological soil protection must be designed for the long term: it is a process, not a sprint. Sustainability and scaling require a programmatic approach (developing business models, supporting value chains for inputs and outputs, securing land rights). However, when working with partners, it helps to start with their realities, reduce complexity and start with **quick wins** (e.g. liming soils in Ethiopia as an entry point).
- During implementation, contradictions sometimes have to be endured and a pragmatic approach to conflicting objectives has to be found.
- Working with civil society is essential for implementation.
- A paradigm shift can only be achieved through innovation and large-scale evidence of impact. Between 2014 and 2024, **17 economic studies** were conducted within ProSoil. The majority of agroecological interventions can be considered profitable or very profitable.
- ProSoil scales up solution approaches, not standardized solutions. Local actors decide which innovations in the field of soil protection are appropriate for which agroecological context. We co-create knowledge, make it available, facilitate the exchange and support our partners in scaling up locally adapted solution approaches.
- Different paths, common goal: Agroecological change is a development path to sustainable agriculture and not an all-or-nothing approach. Likewise, not only maximum solutions in soil protection contribute to change. A good start lies in simple techniques, that can be easily implemented and financed by farmers.

## Further readings and sources

*Mission statement on Agroecology – ProSoil*

*Factsheet Agroecology*

*Agroecology – GIZ Position Paper*

*FAO – Agroecology Knowledge Hub*

*HLPE Report 14 (2019): Agroecological and other innovative approaches for sustainable agriculture and food systems that enhance food security and nutrition*

*Sachstandsbericht 2023 – Globalvorhaben „Bodenschutz und Bodenrehabilitierung für Ernährungssicherung“*

*The IPBES assessment report on land degradation and restoration*

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**Published by:**  
Deutsche Gesellschaft für  
Internationale Zusammenarbeit (GIZ) GmbH

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I Soil Matters: <https://www.giz.de/en/worldwide/207042.html>

**Design/Layout**  
EYES-OPEN and weissbunt, Berlin

**Photo credits:**  
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This publication was produced with the financial support of the  
European Union and the German Federal Ministry for Economic  
Cooperation and Development (BMZ). Its contents are the sole  
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the European Union and the German Federal Ministry for Economic  
Cooperation and Development (BMZ)

Bonn, May 2025

