Agroecology

Context

The transformation of global agricultural and food systems is a central task of the coming years. Ensuring food security for a growing world population, maintaining healthy ecosystems to support livelihoods and the economy, reducing climate risks and lowering greenhouse gas emissions are core objectives of future-proof agricultural and food (agri-food) systems.

Suitable solutions require the integration of as many system components as possible – from food cultivation, processing and trade, through consumers and their behaviour, to the relevant political and social environment.

Given the complexity of the issue at hand, agroecology has established itself in the scientific and political debate as a significant paradigm to address it. This paradigm can be translated to reality, as shown by abundant examples and success stories from different contexts. Provided it is implemented properly, agroecology is considered to have great potential for the socio-ecological transformation of agri-food systems. Furthermore, agroecology embeds the broader 'One Health' approach within the realm of these systems, thus strengthening human, animal and environmental health. All in all, significant contributions can be expected from agroecology towards the achievement of international commitments such as the United Nations Sustainable Development Goals (SDGs), the Paris Agreement, and the post-2020 agenda of the Convention on Biological Diversity.

What is agroecology?

There is no set definition of agroecology but rather 13 principles that serve as guidance to understand its meaning (see *Figure 1*). These principles are the basic building blocks for its implementation and provide guidelines for the transition to a more sustainable agricultural and food sector. Agroecology can be understood as a scientific discipline, a set of farming practices and a social movement. As such, it extends far beyond farming practices.

1. Agroecology as a scientific discipline

As a scientific discipline, agroecology studies processes and cause-and-effect relationships on agricultural land, such as cropland and pastures. In addition, it looks at the interdependencies between agriculture and semi-natural ecosystems, such as nearby forests and water bodies. Recently, questions arising from the analysis of socio-ecological systems and from political ecology have also been included in the scientific discussion.

2. Agroecology as a (farming) practice

Agroecological practices are local-specific methods that use, preserve and improve biological and ecological processes in agricultural production. They thereby reduce the use of external inputs (such as synthetic agrochemicals) and create diverse, resilient and more productive agroecosystems. At their core is the promotion of positive interactions and synergies between plants, animals, soil, water and the agri-food system. Agroecological farming systems place a strong focus on diversification, e.g. through practices such as mixed cropping and intercropping, agroforestry, use of the locally adapted seeds, biological pest control and management, green manure, among others. These practices target in particular soil structure, the regulation of water balance, and soil as well as plant health.

Agroecology has much in common with organic farming. However, in contrast to agroecology, organic farming focuses on the agricultural aspects of agri-food systems and is regulated by clearly defined standards (see also factsheet on 'Agroecology and organic farming').

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Because of its social and political dimensions, agroecology goes far beyond farming: its aim is to strengthen local and regional agri-food systems, thereby contributing to rural development.

3. Agroecology as a social movement

Agroecology as a social movement emerged as an antithesis to industrial agriculture. The movement strives to empower small-scale farmers, who often find themselves deprived of their rights and lack services such as agricultural education and advice. Its objective is to transform local agri-food systems on the basis of the right to food. By generating local added value, reducing the distance to markets and through fair and safe food production, agroecology aims to strengthen the economic viability of rural areas. It supports various forms of (small-scale) agricultural production as well as food sovereignty, local knowledge, social justice, local identity and culture. This also extends to controlling the access to land, seeds and water as well as fair trade relations.

A new and holistic concept

The holistic interpretation of the Food and Agriculture Organization (FAO) provides important guidance for development cooperation. It describes agroecology as a dynamic, inter-disciplinary approach to agri-food systems which includes all stages from production to consumption. It takes into account all environmental, socio-cultural, technological, scientific and political dimensions of agri-food systems, and explicitly promotes their transformation. The agroecological transformation starts by ensuring that natural resources are managed sustainably. In later stages, it seeks to develop local and fair agri-food systems in accordance with the right to appropriate, sufficient and healthy food.

An inclusive rural community is a key element of such local, small-scale circular economies. Cooperation among stakeholders from politics, science, the private sector and civil society is key, especially in order to develop context-specific solutions. Scientists and practitioners need to learn from each other, taking into account local knowledge and cultural values and disseminating information horizontally among farmers and other stakeholders along the food chain. The objective of this transformation is to develop agri-food systems that ensure food security for all on a sustainable basis – now and in the future.

Levels and principles of agroecology

According to Gliessman (2014), the agroecological transformation of agri-food systems takes place gradually across five interlinked levels. Transformation in the first two levels happens within farms. The third one includes the whole agroecosystem. Levels four and five expand the scope to the entire agri-food system. This process is based on 13 agroecological principles consolidated by the international High Level Panel of Experts on Food Security and Nutrition (HLPE) in July 2019, on the basis of the 10 elements proposed by the FAO in 2018. The interrelation between principles, transformation levels and their scale of integration is shown in *Figure 1*.

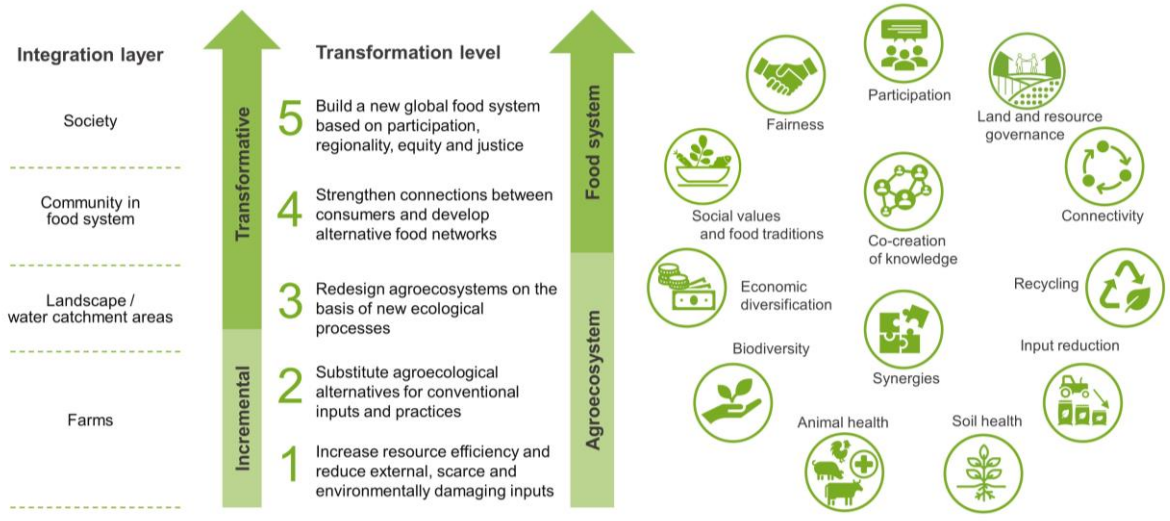

Figure 1: 13 principles (HLPE, 2019) building on the 10 elements of the FAO (2018), and 5 levels of agroecology (Gliessman, 2014).

Development-policy perspective

In recent years, agroecology has gained significant importance in the international discourse on future-proof agri-food systems. The conclusions and recommendations made by current international reports also emphasise the urgent need to redesign the agricultural and food systems (e.g. see *HLPE Report, 2019*). Agroecology offers concrete, tried-and-tested solutions – which need to be disseminated and implemented on a broad scale.

The German Bundestag acknowledged this development in its *resolution of June 2019*, which calls upon the German Federal Government to continue its commitment to agroecology and expand it with respect to development cooperation and the promotion of rural areas.

Commitment of the German Federal Ministry for Economic Cooperation and Development

Like many other international donors, the German Federal Ministry for Economic Cooperation and Development (BMZ) is increasing its support for agroecology. This translates into numerous commitments to financial and technical cooperation projects and activities on agroecology.

Several projects relating to agroecology (including organic farming) are currently being implemented, for example within the scope of the "One World – No Hunger" initiative. These include (among others) the global programme "Soil Protection and Rehabilitation for Food Security", the global programme "Knowledge Centres for Organic Agriculture in Africa" as well as the organic farming working group of the global programme "Green Innovation Centres for the Agriculture and Food Sector".

Commissioned by BMZ, the GIZ's Sector Project "Sustainable Agriculture" provides advice on the topic of agroecology. The project supports capacity development of global, regional and national partners and projects in international cooperation by promoting training, knowledge products and networking among stakeholders. For example, it supports exchanges between policymakers on support mechanisms for agroecology and on developing leadership competencies in African organisations to promote agroecology and organic agriculture.

In Germany, BMZ regularly organises expert discussions on agroecology with the participation of civil society, the private sector and other federal ministries, and is involved in conceptual and policy debates on the topic.

Examples of our work

Through the global programme "Soil Protection and Rehabilitation for Food Security" (commissioned by BMZ as part of the "One World – No Hunger" Initiative), GIZ supports and advises small farmers in **Ethiopia, Benin, Burkina Faso, India, Kenya, Madagascar and Tunisia** on agroecological practices and transformation processes. Alongside the respective government agencies of each country, stakeholders from the scientific community, civil society and the private sector are also involved in the measures. Since 2014, 2.2 million small farmers have been reached and 261.500 ha of agricultural land have been rehabilitated or protected. The contribution of soil protection

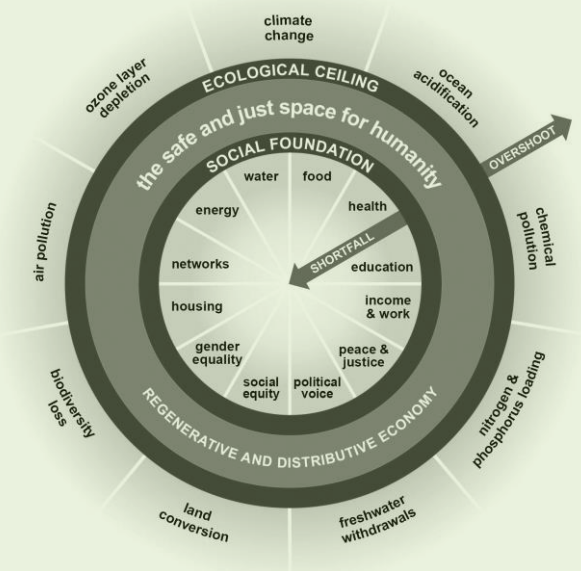

Figure 2: From Raworth, Freundl and Schmid, 2018, The Doughnut Economy.

The Planetary Boundaries

A sustainable transformation of global agriculture and food systems is imperative in order to secure the future. In 2017, economist Kate Raworth elaborated on the work by Rockström et al. (2009) that described the "planetary boundaries". She expanded the model of ecological ceilings (e.g. for water, phosphorus and nitrogen) to include the need for a social foundation that, only within the planetary boundaries, creates a "safe and just space for humanity to thrive in". In line with this model, agroecology serves as a suitable transformation pathway for redesigning and reorienting food systems and making them more resilient in the long term.

to climate change mitigation and adaptation is measured through a climate monitoring system. This constitutes a first step towards integrating soil protection within climate finance.

Agroecology through landscape-wide soil protection.

Through its "Green Markets and Sustainable Consumption" project in **Brazil**, GIZ supports smallholder farming cooperatives as well as indigenous and traditional population groups in gaining better market access for their agroecologically-farmed produce. In addition, individual federal states, such as the State of Amazonas, receive support in developing their own agroecology strategies. Besides private sector value chains, public procurement programmes, such as for school meals, play an important role in promoting marketing and distribution efforts. These programmes provide special support for produce from organic and small-scale farming.

Through training courses, model farms, digital services, radio or village cinema and other measures, the global programme "Knowledge Centres for Organic Agriculture in Africa" (as part of the "One World – No Hunger" Initiative) helps to close knowledge gaps hindering the spread of organic farming on a large scale. The programme is managed from Germany and is being implemented together with non-governmental organisations in **North, West, Eastern, Central and Southern Africa**. The offered services cater to associations, advisors, trainers, producers, processing enterprises, retailers and consumers. In addition, the project encourages networking among key stakeholders in production, processing and marketing along selected value chains. In this case, the focus is placed on enabling better access to markets on the basis of adapted certification methods.

Sustainable Development

Agroecological approaches can make a significant contribution towards reaching the Sustainable Development Goals.

They help to overcome poverty (SDG 1), contribute to food security (SDG 2) and good health (SDG 3) by encouraging sustainable food production systems and resilient farming practices.

Networking producers and consumers can also contribute to responsible consumption and production (SDG 12).

This helps to conserve healthy soil, water and ecosystems (SDG 14+15) and build resilience to extreme weather events such as droughts and floods (SDG 13), so strengthening people's capacity to adapt to climate change.

Additional information: www.giz.de/de/weltweit/39650.html

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

Registered offices: Bonn and Eschborn, Germany

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May 2020

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Design.:
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