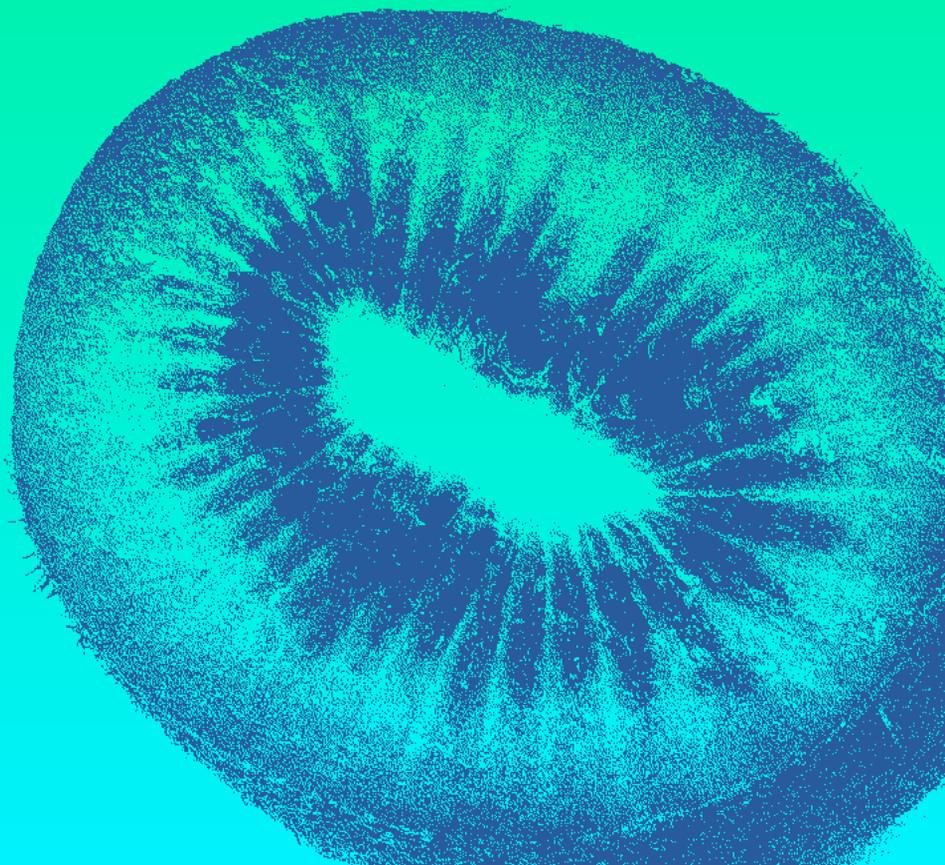


Chapter IV

Introduction to the Concept of Agroecology and Sustainable Food Production System



As we saw in the previous chapter, food, food chain, food-sovereignty are crucial concepts in Sustainable Development. Here we give a short overview of the concept and practice of Agroecology.

1. Sustainable food production systems

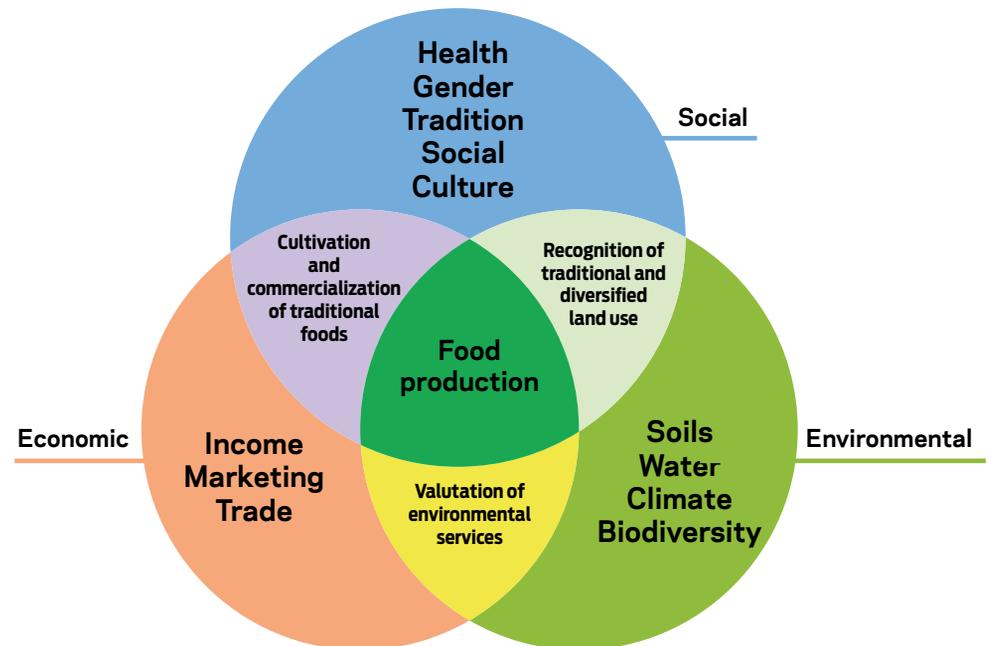


Figure 1. The three pillars of sustainable food agriculture

We know from the previous chapters, that industrial agriculture was only partially successful on meeting global food demands in the 20th century, as already the food-crises at the end of the 1970-es became a reality.

What are the main problems with the industrial agriculture?

- the environmental impact
- social problems

Now the threats and impact of the practices and policies followed raises the need for a paradigm shift towards a truly sustainable food production system. A sustainable food production system is a collaborative network that integrates several components in order to enhance a community's environmental, economic and social well-being. It is built on principles that further the ecological, social and economic values of a community and a region.

We consider sustainable food production systems, when they provide the following benefits to the stakeholders involved:

Economic: Generates a fair income for all parties working in food production and trade; helps strengthen local economies; values environmental services economically;
Social: Provides a healthy working environment for workers and healthy food to consumers. Tradition and cultural values are reflected in production methods and variety selection, but at the same time producers have access to innovative knowledge;

Enviromental:Sustainable food systems also aim to preserve water and soil quality,

enhance biodiversity both on the farm and landscape level while being climate friendly, thus have also a strong environmental aspect.

1.1. What is Agroecology?

Agroecology is a concept, where Science, Practice and Movement are equally important and where is a constant exchange among the three pillars.

Science: it gives priority to action research, holistic and participatory approaches, transdisciplinarity that is inclusive of different knowledge systems.

Practice: it is based on sustainable use of local renewable resources, local farmers' knowledge and priorities, wise use of biodiversity to provide ecosystem services and resilience, and solutions that provide multiple benefits (environmental, economic, social) from local to global.

Movement: it defends smallholders and family farming, farmers and rural communities, food sovereignty, local and short food supply chains, diversity of indigenous seeds and breeds, healthy and quality food¹.

1 - <http://www.agroecology-europe.org/our-approach/our-understanding-of-agroecology/>

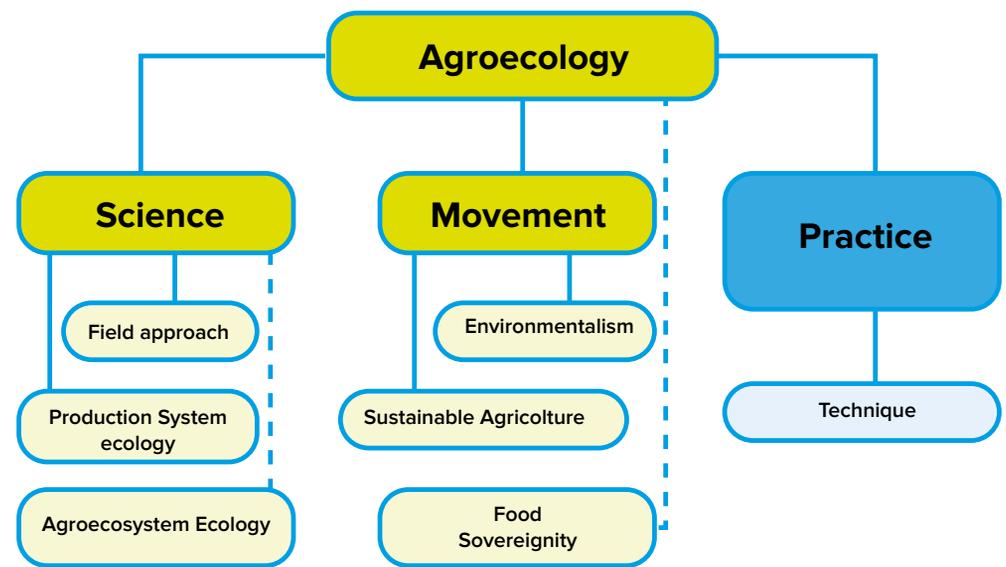


Figure 2. Chart of agroecology structure (Wezel et al.,2009)

The science aims restoration of the agricultural ecosystem and the food production system as a whole, includes the application of ecological principles to the design and management of biodiverse, productive and resilient farming systems. Agroecology uses disciplines from modern agricultural science but its approach is also influenced by the indigenous knowledge systems about soils, plants, etc. that have nurtured traditional farming systems for millennia. By promoting a dialogue of wisdoms thus integrating elements of modern and ethnosciences, a series of principles emerge, which, when applied in a particular region take different technological forms depending on the socio-economic, cultural and environmental context. Agroecology has a strong focus on soil, and regeneration methods, which helps soil fertility and the creation of healthy soil again.

Agroecology does not promote single technical recipes but rather principles, it is an agriculture based on processes.

Besides science and practice, agroecology also refers to a wide variety of social movements aimed at environmental protection, the development of sustainable farming systems and food sovereignty. The concept of "movement" is used in order to stress the vision of social and economic positive impact that Agroecology potentially has for sustainable rural development.

Despite the strong influence of ecology as a core discipline, agroecology also enjoys the

influence of social sciences like ethnoecology, rural sociology and ecological economics. Agroecology uses a holistic approach, therefore it is considered as a transdisciplinary approach, which integrates the advances and methods of social and natural fields of knowledge around the concept of the agroecosystem viewed as a socio-ecological system. Agroecology provides the knowledge and methodology necessary for developing agricultural systems that are on one hand environmentally sound and on the other hand highly productive, socially equitable and economically viable.

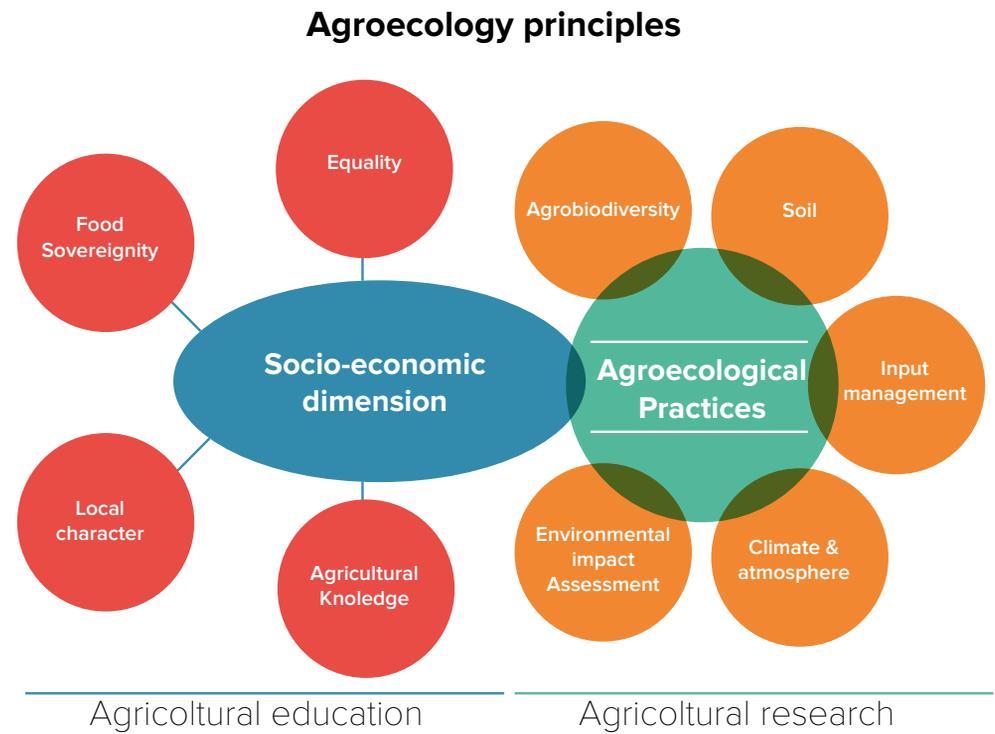


Figure 3. Agroecological principles (By V. Gkisakis)

Agroecology also involves the design and implementation of food production systems aimed to maintain, both internal and external, functions which natural systems provide, is strong, productive and fair. This means an approach of "integration" "close-loop" production systems based on local inputs, increasing the biological and genetic diversity processes, "regeneration" rather than degradation.

The Agroecology sector emerged as a different model to address the problems of world agriculture caused by industrial food production model and it is based on the principles of Sustainability, Integrity, Equality, Performance and Stability. The primary concepts of agroecology and corresponding management practices resonate with arguments for food security, food sovereignty and sustainable rural development.

The agroecological concepts and principles embrace a wide range of practices and have broad scope for implementation. This means that they have considerable resonance with other concepts, principles and practices in the field of sustainable agriculture that also offer alternative structures to the mainstream paradigm of industrial agriculture.

Such key approaches within the sustainable agriculture are the approach of Permaculture, biodynamic agriculture, organic farming, conservation agriculture, urban farming, and multifunctionality in agriculture. Multifunctionality refers to the non-trade benefits of agriculture, like environment protection, land-scape preservation, rural employment and food security. Benefits to society, culture, a national economy as a whole, national security, and other concerns. For example, in addition to providing food and plant-derived products for the population, agriculture may also provide jobs for rural people and contribute to the viability of the area, create a more stable food supply, and provide other desired environmental and rural output.²

The context of agroecology expanded over the years from the field, through the farm,

² -https://en.wikipedia.org/wiki/Multifunctionality_in_agriculture

to the landscape; and in a wider understanding to the food system level. Agroecology promotes ecologically and culturally sound food systems and food sovereignty, protecting people's ability and right to define their own models of food production, distribution and consumption.

An agroecological approach in rural development can contribute to empowering disadvantaged communities through diversifying activities of farmers and including new groups in different levels of the food system- production, processing and trade. This helps to strengthen employment; local food security and food; can prevent population decrease. As defined by Wezel (2016),

Agroecological territories are areas where a transition process towards sustainable agriculture and food systems is engaged. For this transition, three main domains must be considered:

- 1) Adaptation of agricultural practices
- 2) Conservation of biodiversity and natural resources
- 3) Development of embedded food systems. Stakeholder group strategies, developed by those who actively engage in these three domains and are themselves actors in the transition, are integral to agroecology territories.

Agroecological principles provide a good basis for addressing interactions between stakeholders and landscapes. Territorial links help to address social and economic problems in an area. It is important to understand, that feeding people is not only a production issue, but it is connected to availability, locality, and to the cultural and environmental heritage. A transition toward agroecology territories, food systems should be addressed as socio-technical networks, linking people, natural elements, cultural heritage that interact with food issues.

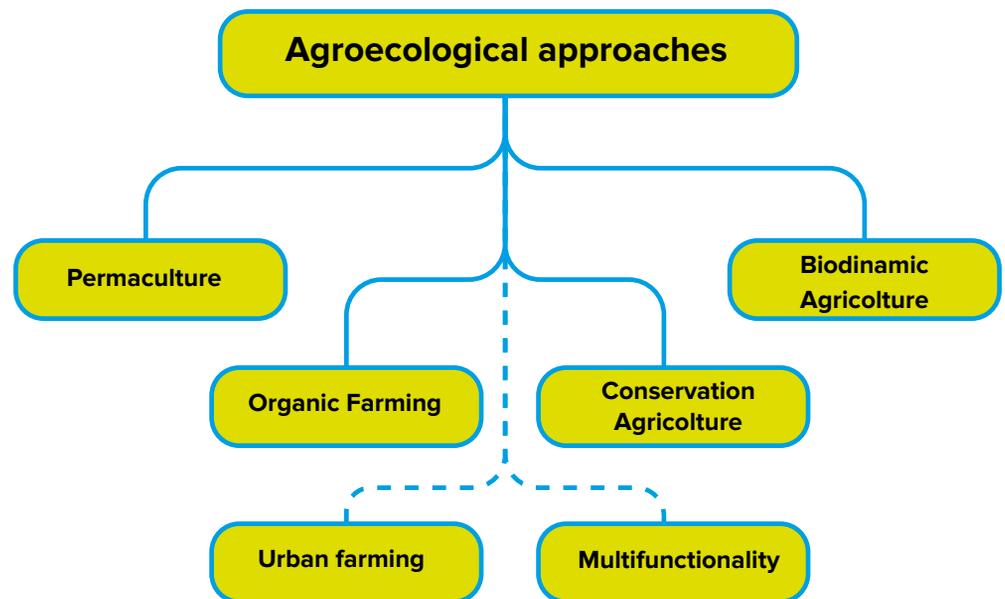


Figure 4. Agroecological approaches

The agroecological concepts and principles embrace a wide range of practices and have broad scope for implementation. This means that they have considerable resonance with other concepts, principles and practices in the field of sustainable agriculture that also offer alternative structures to the mainstream paradigm of industrial agriculture.

1.2. Benefits of the agroecological approach for rural communities and their sustainable development

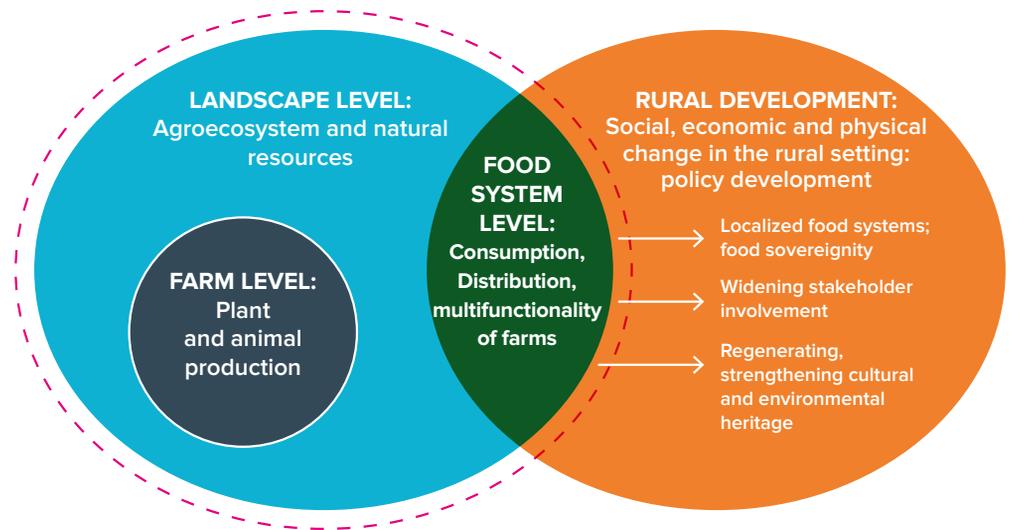


Figure 5. The scope of agroecology in connection to rural development

As described above, the agroecological planning has a strong focus on analysis of farm layout, resources and designing accordingly and focuses on shortening supply chains. This can lead to significant local economic benefits, such as employment creation and economic ownership that stays in community, as it is mentioned under the paragraph of multifunctionality.

Policy makers and local decisions makers could do strengthen local communities and restore the environment by

- 1) providing an increased cooperation potential between the public and decision makers in terms of food production, consumption and marketing;
- 2) providing solutions to food security & sovereignty and diet diversity issues;
- 3) strengthening local economies by income generation and diversification (on- off- non farm activities);
- 4) empowering disadvantaged communities and prevent population decrease, through diversified activities involvement of new groups in food production/ processing/ trade- strengthen employment.

The main pathway for decision makers to accomplish the above is applied by utilizing resources of Knowledge, environmental, cultural/ Innovative practices for farming and social development answering to the needs of local communities.

At community level there it is possible start community planning processes, which can lead to

- local small scale farming projects,
- organize local food chains (through shopping communities)
- awareness raising for healthy lifestyle, fooding, etc. etc..

About the methodology of community planning processes and community development see the chapter: Tools and Methodology.

There is are different approaches needed, when:

- the initiative for change comes from within the community,
- the initiative for change comes from the decision makers.

For a successful change it is necessary that both partners become active, thus the involvement of all possible partners is important.

Transition towards the agroecological approach could be favoured and facilitated by different actors and action:

- policy makers by

- enhancing of farmer-to-farmer knowledge exchange
- providing extension services delivered by agents familiar with agroecology;
- accompanying local groups of farmers, such as farmer associations and sharing a common technical advising service; and
- providing incentives (e.g., agro-environment measures) to initiate change. In certain cases, regulatory policies at the local and the national level can be taken into consideration to assist such change of agricultural practices

1.3. Examples of applied agroecology

a) Organic Farmers Cooperative of Messara (Crete)

The set-up of the Organic Farmers Cooperative of Messara is one of the first examples of an agroecological approach in agriculture in Greece. At first, the initiative of a local Dr. agronomist, specialized in Agroecology the Design & prototyping of olive production started at Messara, southern Crete, Greece in 1992. In the initial phase an agroecological set-up was conducted including

- diagnosis of the shortcomings of current production system;
- design & prototype of ecological olive production;
- selection of parameters (indicators of the performance and sustainability of the designed systems).



A participatory approach for designing the farming methods has been then set-up in co-operation with the pilot growers for achieving the desired results of the parameters. Besides the pilot group of growers an agri-environmental group (Cretan Agri-environmental Group) was established to introduce and develop an ecological knowledge system that will support ecological olive

production and will support learning process. Eventually a network of Organic farmers Cooperative of Messara, Crete (ASBM) was launched by 44 farmers in 1998. Their goals were to cooperatively market certified organic products produced by our members., encourage a farming future emphasizing ecological and economic sustainability, practice environmental awareness and cooperative principles in all aspects of production, handling, marketing and operations and promote a respect for the diversity, dignity, and interdependence of human, animal, plant, soil, and global life.

b) Agricultural & Social Cooperative "Melitakes" (Crete)



"Melitakes" is a social cooperative of small-scale farmers located in the southern part of Crete, Greece which initiated in 2015. It involves a network of local communities' actors which follow agroecological principles to collectively produce and process products. It also involves the creation of a seed exchange network and a

community seed bank and the collaboration with similar organisations and networks abroad. Local agronomists and external trainers also collaborate providing introductory courses to the concept of Agroecology.

c) Pro Ratatouille program (Hungary)



The Pro Ratatouille program is a complex agricultural, adult education and community development initiative, especially for disadvantaged groups in rural Hungary. The project started in 2013, and as of 2017 it is running in six villages in the East of Hungary. The village programs include complex adult education, employment, nutritional and community building activities. The approach emphasizes the importance of organic agriculture based rural development, fair distribution of the goods produced, community based innovation and business development. Community based agriculture helps to develop community

awareness, lowers unemployment, fights malnourishment and introduces a healthy and sustainable lifestyle. Combined, these effects positively influence the worldview of the participants and show a liveable alternative to younger generations. The program also helps to fight the prejudices towards the Roma minority by enabling Roma and non-Roma members of a community to work together towards a common goal. The planning and setting up of the Pro Ratatouille gardens and an extended village development program includes a wide range of stakeholders; new farmers, decision makers and local citizens. During project planning and development; local natural, human and economic resources are mapped; so the project can be adapted to local conditions. With a complimentary activity of nutritional and rural development education; not only the gardeners, but a wider public is reached; local consumption of the produced goods and awareness is strengthened.

The Pro Ratatouille program has a strong networking component that helps to connect participating communities and decision makers to learn from each other and together about sustainable rural development and developing together short food supply chains. In 2016, a participatory guarantee system was introduced in order to certify the vegetables produced in an agroecological manner; with the participation of different stakeholder groups. The certification enables the development of a brand with fair-trade and organic values that can contribute to strengthening the local food system and gaining consumer trust.

Completing the Food system mapping (present and future) exercise can help you to decide where you would like to start A detailed description of these exercises you will find in the section: **Exercises:Agroecology**