



## What is *Agroecology* ?

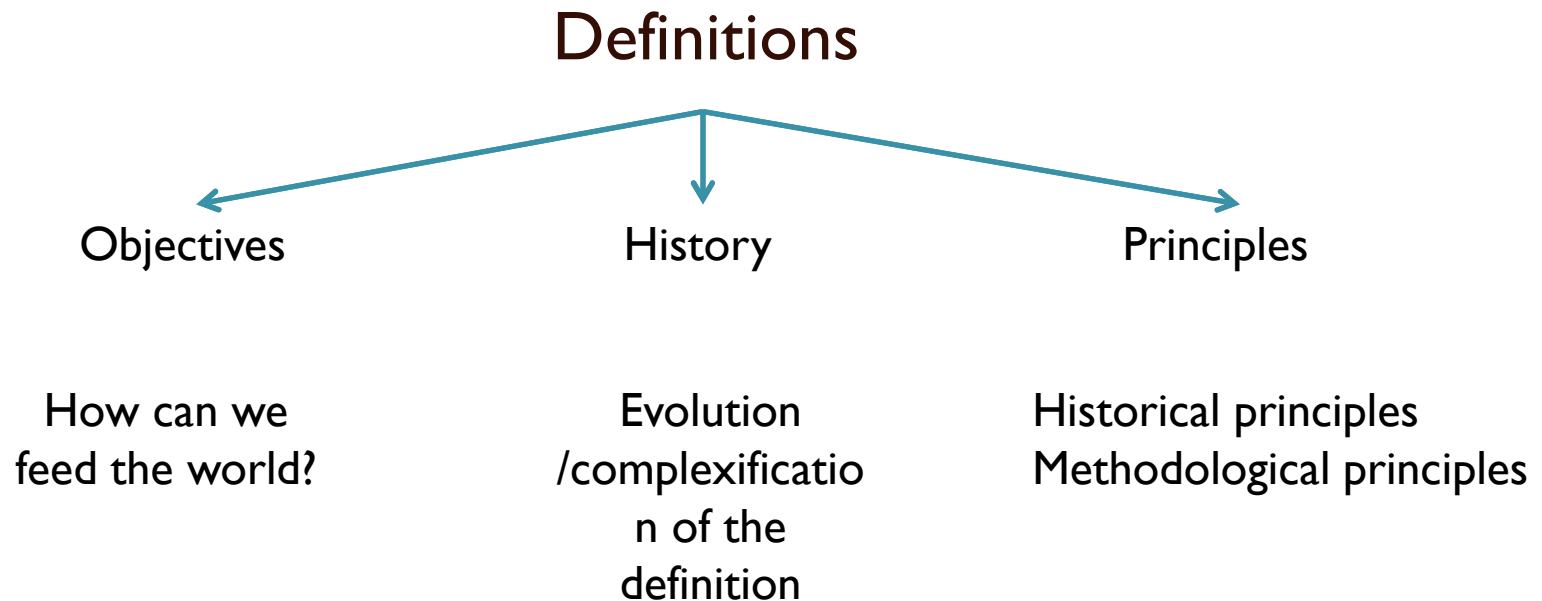
**Source:**

**Agroecology: directions and potential  
for a transition to sustainable food systems**

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GIRAF : Interdisciplinary Research Group in Agroecology  
FNRS, Belgique, [www.agroecology.be](http://www.agroecology.be)

# What is Agroecology ?





# GROWL What is Agroecology ?

## How can we feed the world ?

FAO(2011) The state of food insecurity in the world:

- 850 million people on earth suffer from hunger
  - ½ are small farmers or farm workers living in rural areas
- many others suffer from the erosion of their revenue and autonomy

→ Food crisis

Millennium Ecosystem Assessment (MEA, 2005):

- agriculture use 70 % of the water extracted for human needs
- the global agricultural food system is the main source of soil, forest, fish stocks, and water degradation.
- 2/3 of the worldwide ecosystem services are degraded or unsustainably managed (drinking water, pollination, decomposition of waste, wild food, ...)

→ Environmental crisis

# How can we feed the world ?

Buttel (1995) Twentieth Century Agricultural-Environmental Transitions:

Two possible ways to fight against  
food & environmental crisis  
(+ climate crisis + energy crisis)

←  
Agroecology

based on socio-environmental  
capacity to re-naturalise the  
food systems by  
increasing/strengthen  
employment

Sufficiency-oriented way

→  
Biotechnology

based on biotechnologies to  
increase the food production and to  
insure the needs, quality and sanitary  
security of the global markets

Productivity-oriented way

The way we look at problems and solutions differs **fundamentally**  
between productivity-oriented and sufficiency-oriented thinking.

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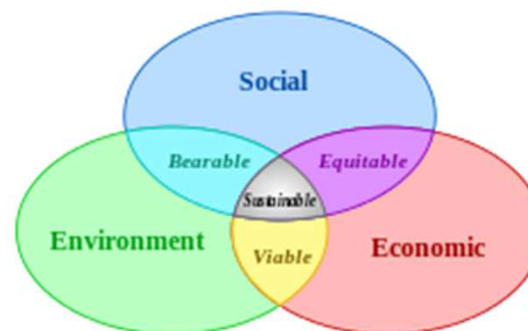
## How can we feed the world ?

### Fundamental presupposition of agroecology :

Agroecology is a new way to ensure a productivity that meets the growing demands of the global market.

Agroecology is a new way to organise the food systems to face the diversity and the multiplicity of food issues and objectives, while taking into account the environmental and social dimensions !

Agroecology focuses foremost on the search for **autonomy** and on the **parsimonious and sustainable use of resources**.



## Historical definitions of Agroecology

**1st time : integration of ecology to agronomy → good practices**

Altieri (1983) The question of small farm development: Who teaches whom?

= application of ecological principles to agriculture

= production of knowledge and practices to make agriculture more sustainable

= working at the level of the whole productive agro-ecosystem (farming system)  
and not only at the level of a single field/crop

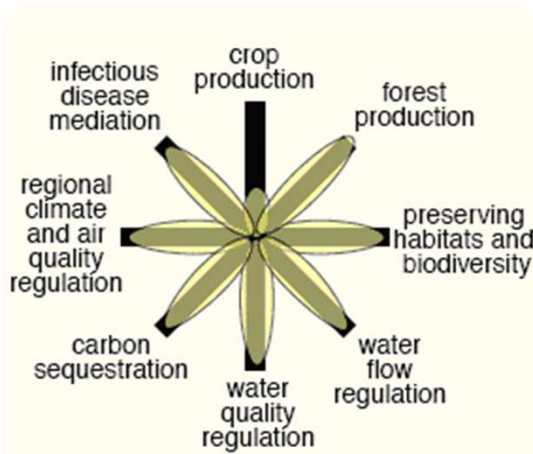
→ The definition is restricted to food production



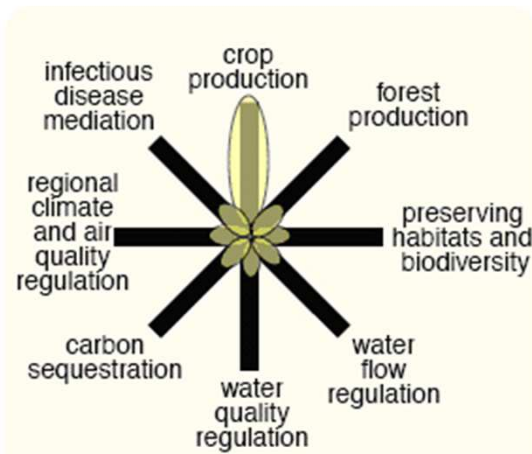
« Agroecology is the application of ecology for the study, the development and the management of sustainable agro-ecosystems »  
(Gliessman 1998)

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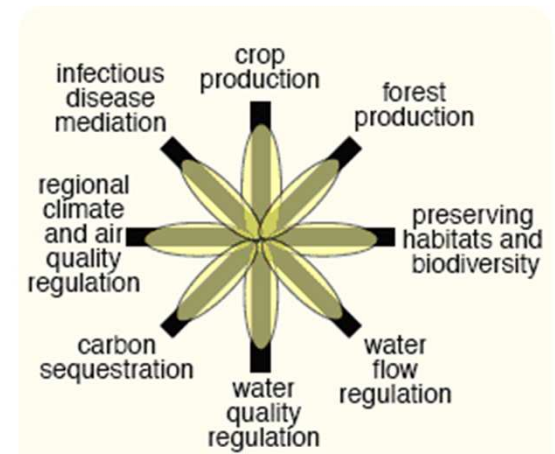
## Agriculture as an ecosystem



natural ecosystem



intensive cropland



cropland with restored ecosystem services

# Historical definitions of Agroecology

## 2nd time: contribution of social sciences

Altieri (1983a), « Agroecology, the scientific basis of alternative agriculture »

Adding, to the production-dimension, the spinneret and consumption management, and the **socioeconomic and political dimensions**

→ The definition is enlarged to the whole food system



Agroecology is the application of ecology to the study, the design and the management of the food systems. By definition, it is an interdisciplinary practice that needs a redefinition of scientific and social limits, which is a major intellectual challenge for agricultural research (Buttel 2003) in ecology and social sciences. It requires the construction of new knowledge and it questions the way scientists (working on agricultural and food systems) are trained.



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## Historical definitions of *Agroecology*

**3rd time: taking into account the relations between sciences and society**

What are the point of view of the associations, citizens, consumers, social actors and practicing people ?

→ The definition is enlarged to the whole society



Agroecology is not exclusively defined by practices, or by sciences, neither by social movements (Wezel, Bellon et al. 2009). It is expected to become a federating concept through actions that are in between these three dimensions.

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## Principles of Agroecology

### The 5 historical principles

Reijntjes, Haverkott et al., 1992

- 1° **biomass recycling** as natural source of nutrients
- 2° improving structural and biotic **soil conditions**: zero-tillage, reduction of chemical fertilisers and pesticides
- 3° promoting use of **sustainable resources** (solar, organic, hydric) and reducing oil use
- 4° promoting **genetic biodiversity** within time and space
- 5° promoting favourable **biological interactions and synergies** (ecological services)





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# Principles of Agroecology

## A 6th historical principle

Machado, Santili et al. 2008

Jackson, Rosenstock et al. 2009

6° Valorising **agrobiodiversity as the starting point** to struggle for food sovereignty and farmer autonomy

# Principles of Agroecology

## Methodological principles

7° Encourage and equip the multicriteria control of agro-ecosystems in a perspective of transition in the long term, including trade-offs between short term and long term perspectives and giving importance to the properties of resilience and adaptability.

8° Exploiting the local resources and characteristics → promoting the diversity and variety

# Principles of Agroecology

## Methodological principles

9° Stimulating exploration of cases away from already known local optima (Weiner, Andersen et al. 2010) eg "extreme" systems with very low input levels and/or organic farming in both crop production and animal breeding (Jackson 2002 ).

10. Promoting the construction of participatory research systems that allow the development of "finalized" research - while ensuring their scientific character - (Hatchuel 2000; Hubert 2002). The development of sustainable systems is indeed complex and requires taking into account the interdependence of actors, their ambiguity and the uncertainty of the socio-economic impacts of technological innovations (Bell and Stassartstraat 2011).

## Principles of Agroecology

### **Socio-economic principles (GIRAF)**

11° Generating knowledge and collective adaptation abilities through networks involving producers, consumers citizens, researchers and governmental technical advisers that promote deliberative forums, the implementation of public debate and the dissemination of knowledge (Thompson 1997; Pimbert, Boukary et al. 2011).

12° Encouraging the possibilities for choices of autonomy to the global markets through the creation of an environment favorable to public goods and to the development of practices and socio-economic models that strengthen the democratic governance of food systems, including through systems co-managed by producers and consumers-citizens and through (re-)territorialized systems with high manpower intensity (Ploeg 2008; Wittman, Desmarais et al., 2010).



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## Principles of Agroecology

### **Socio-economic principles (GIRAF)**

13° Enhancing the diversity of useful knowledge: local (Hassanein and Kloppenburg 1995) or traditional (Indigenous Technology Knowledge - ITK (Richards 1993)) knowledge and practices, common knowledge (Wynne 1996) as well in problems and affected public construction as in search of solutions.