



UNIVERSITÀ  
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Innovation in Food Loss and Waste Management  
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# How Can Agroecology contribute to the reduction of Food Waste and Loss?

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# How Can Agroecology contribute to the reduction of Food Loss and Waste?

## *Part 1: Agroecology*

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# Food waste and hunger



- It is estimated that around **735 million people are hungry, malnourished** and food insecure (**have difficulty acquiring food**) (FAO, *The State of Food Security and Nutrition in the World 2023*)
- **In Developed countries** certain easily exportable food products are underused and go to waste; some others are imported and overconsumed (cereals, legumes)
- **In Developing countries** food is lost due to ineffective internal transportation and storage.

**Of all the food produced on our planet 1/3 is wasted!**

**Hunger is often caused by food loss and waste and inequality of distribution, not by scarcity.**

# Cost of food waste

An estimated **1.3 billion** tons per year of food never reaches the table.

**What does it cost our environment to produce the food that we throw away?**

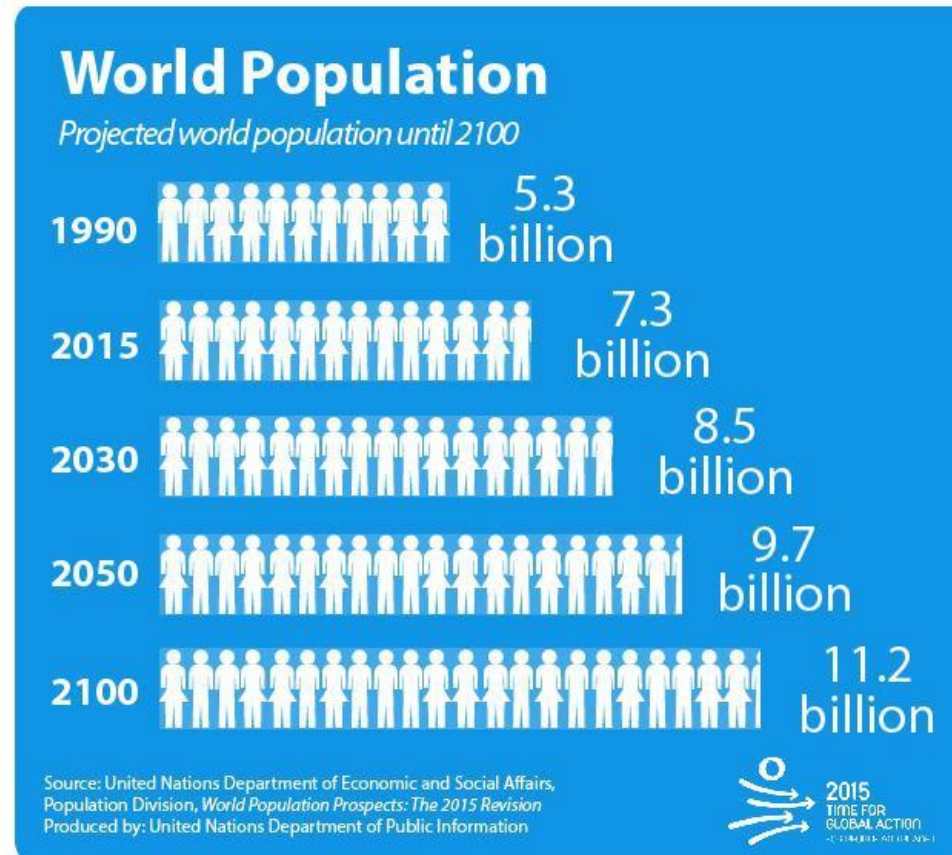


# World population

About **8 billion**  
people today



Nearly **10 billion**  
by the year 2050





# We need a change!

The **paradigm** of the current food systems that has driven us until today **has failed!**

We need a **transformational change** in all productive sectors that truly addresses the different dimensions of sustainability: economic, environmental and social.



# Agroecology

*Agroecology and FLW*



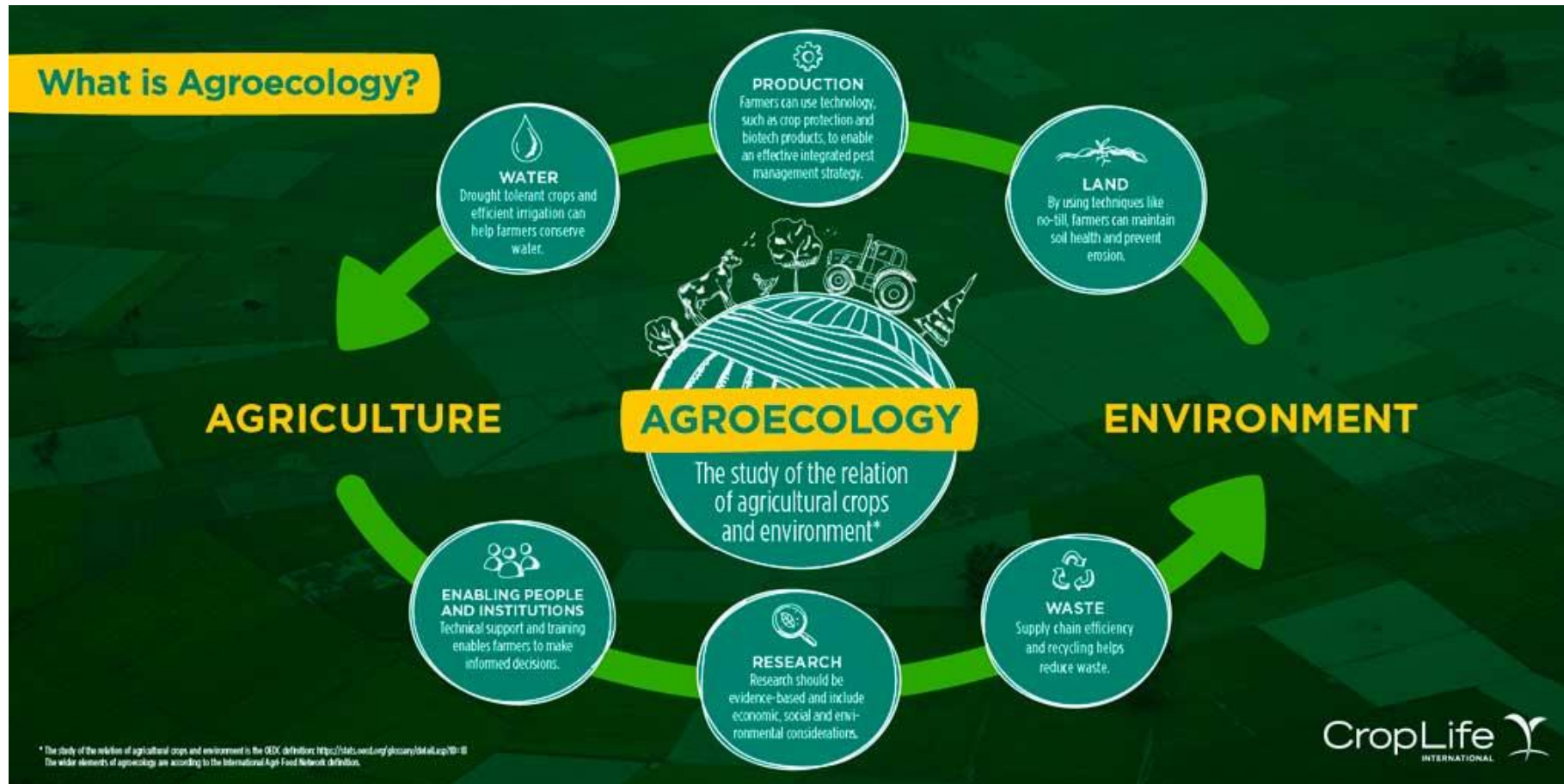






# Agroecology: definition

**Agroecology** is a holistic and integrated approach that simultaneously applies ecological and social concepts and principles both to the design and management of sustainable agriculture and **food systems**.



# Agroecology: definition

Agroecology represents a transdisciplinary field that includes the ecological, socio-cultural, technological, economic and political aspects, **encompassing the entirety production chain of the food systems**, from production to consumption.

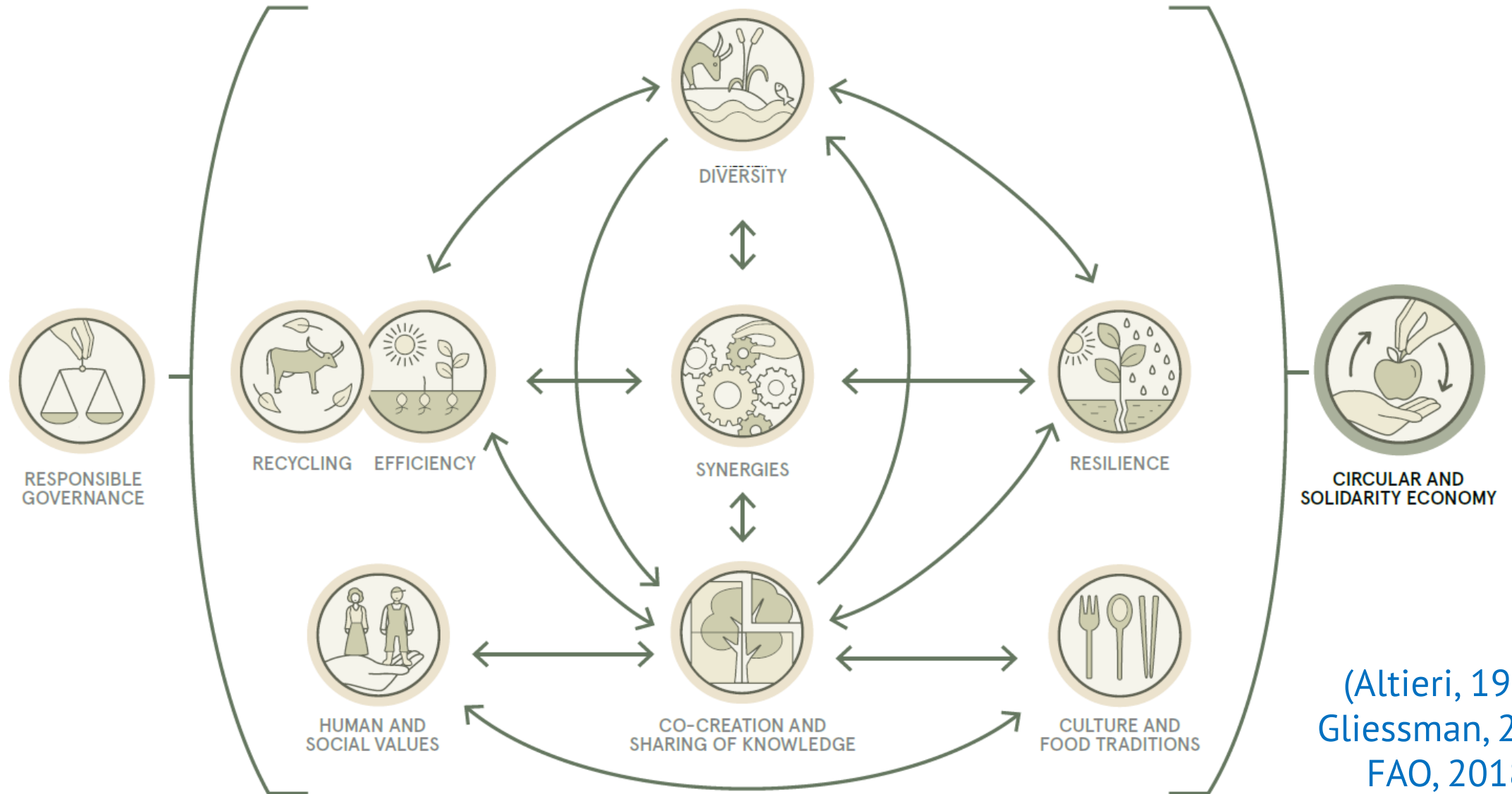


# Agroecology: definition

## The tangible challenges of Agroecology:

- Relies on **biodiversity**
- Promotes **internal inputs** (e.g. nutrient cycling, locally adapted genetics) rather than external inputs (e.g. fertilizers, pesticides, imported concentrate feed, imported not locally adapted genetics)
- Highly knowledge-intensive, builds upon farmers' collective **knowledge and innovations** (attractive for **rural youth**)
- Emphasizes importance on **social equity** (job creation and gender aspects)
- **Promotes local markets** and direct consumer-producer exchanges (value addition and diverse diets).

# Agroecology: the ten elements



(Altieri, 1995;  
Gliessman, 2015;  
FAO, 2018)



# Agroecology and food waste?

So, how can Agroecology contribute to the reduction of food waste and loss?



# How Can Agroecology contribute to the reduction of Food Loss and Waste?

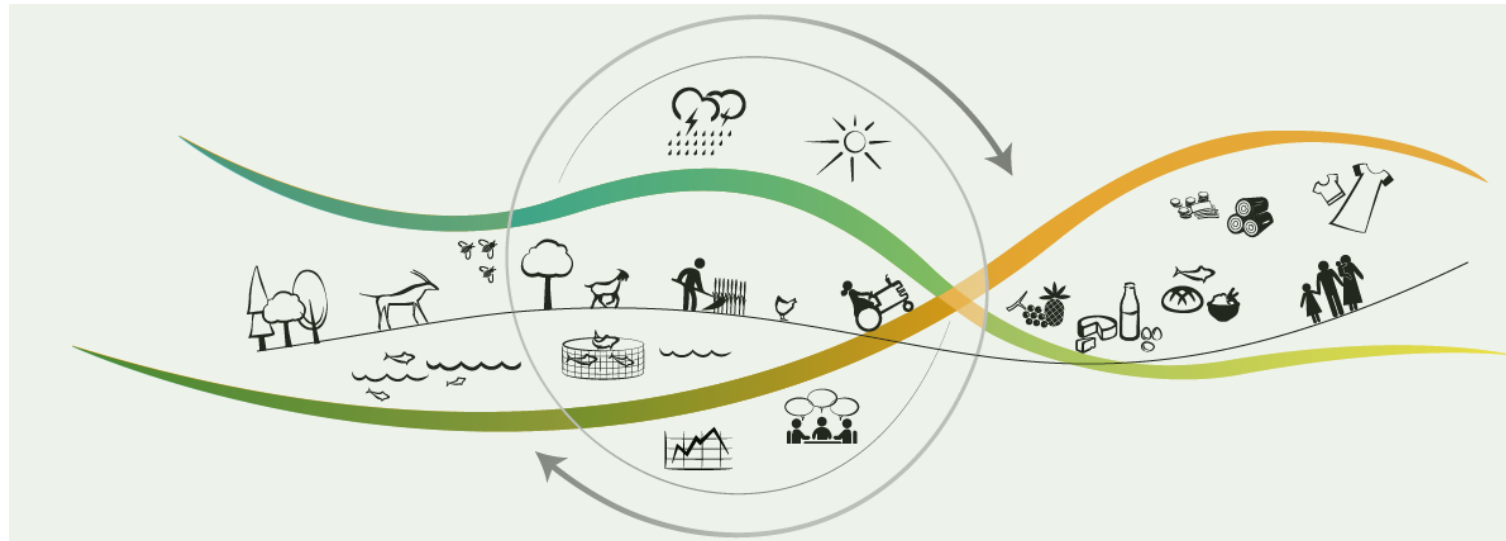
## *Part 2: Agroecology-based Sustainable Food Systems*

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# Transition towards agroecology-based sustainable food systems

1. increasing the efficiency of practices and resources and substituting external inputs
2. transforming agricultural production systems to be more resilient and sustainable
3. strengthening markets that support agroecology
4. building an enabling environment for more sustainable food systems



(FAO, 2018)

# Approaches for the agroecological transition

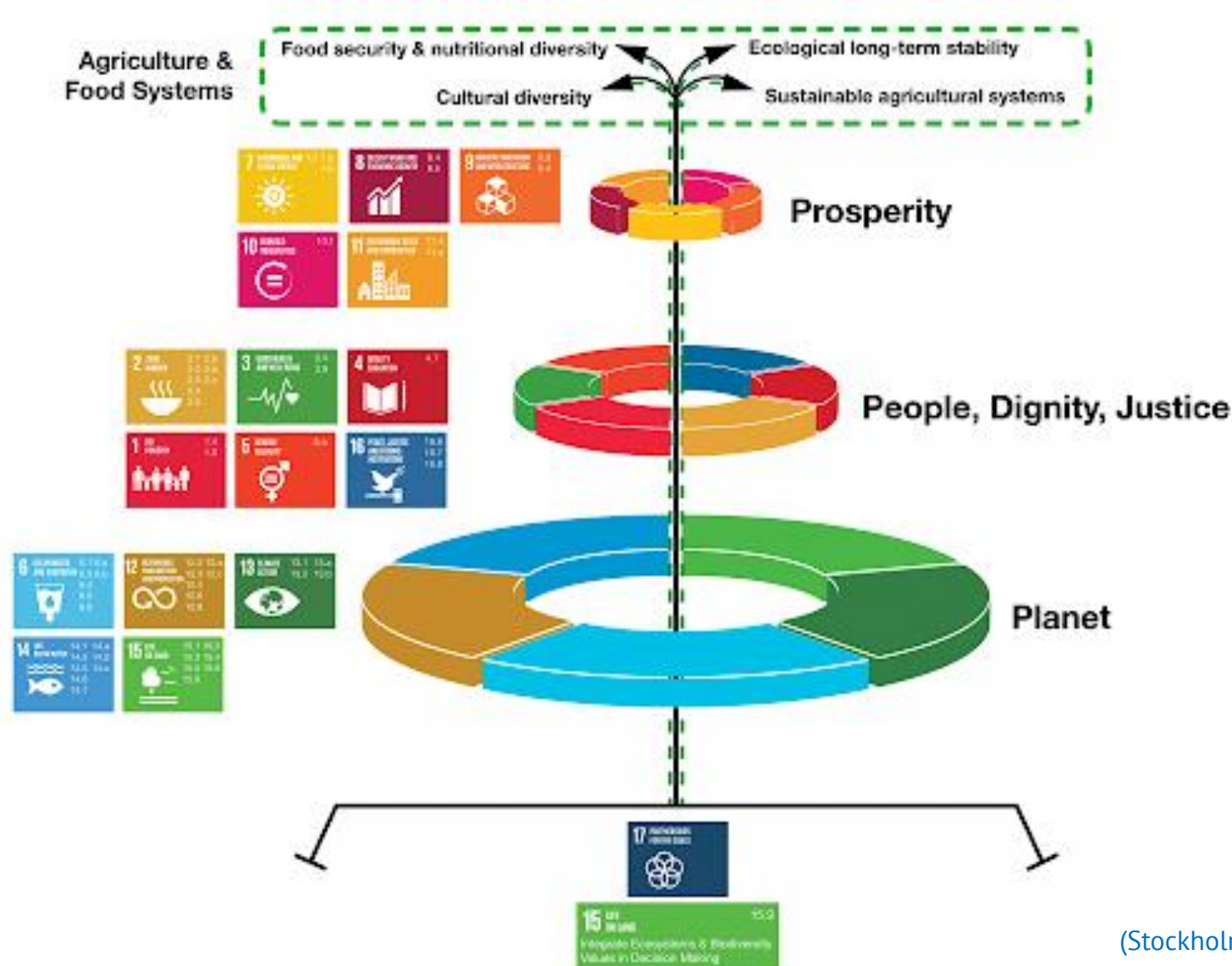
- Systemic thinking
- Multidisciplinary
- Participative
- Acting on the problem's causes, not only on the effects
- Retro-innovative
- Bio-regional
- One Health (WHO, 2015)



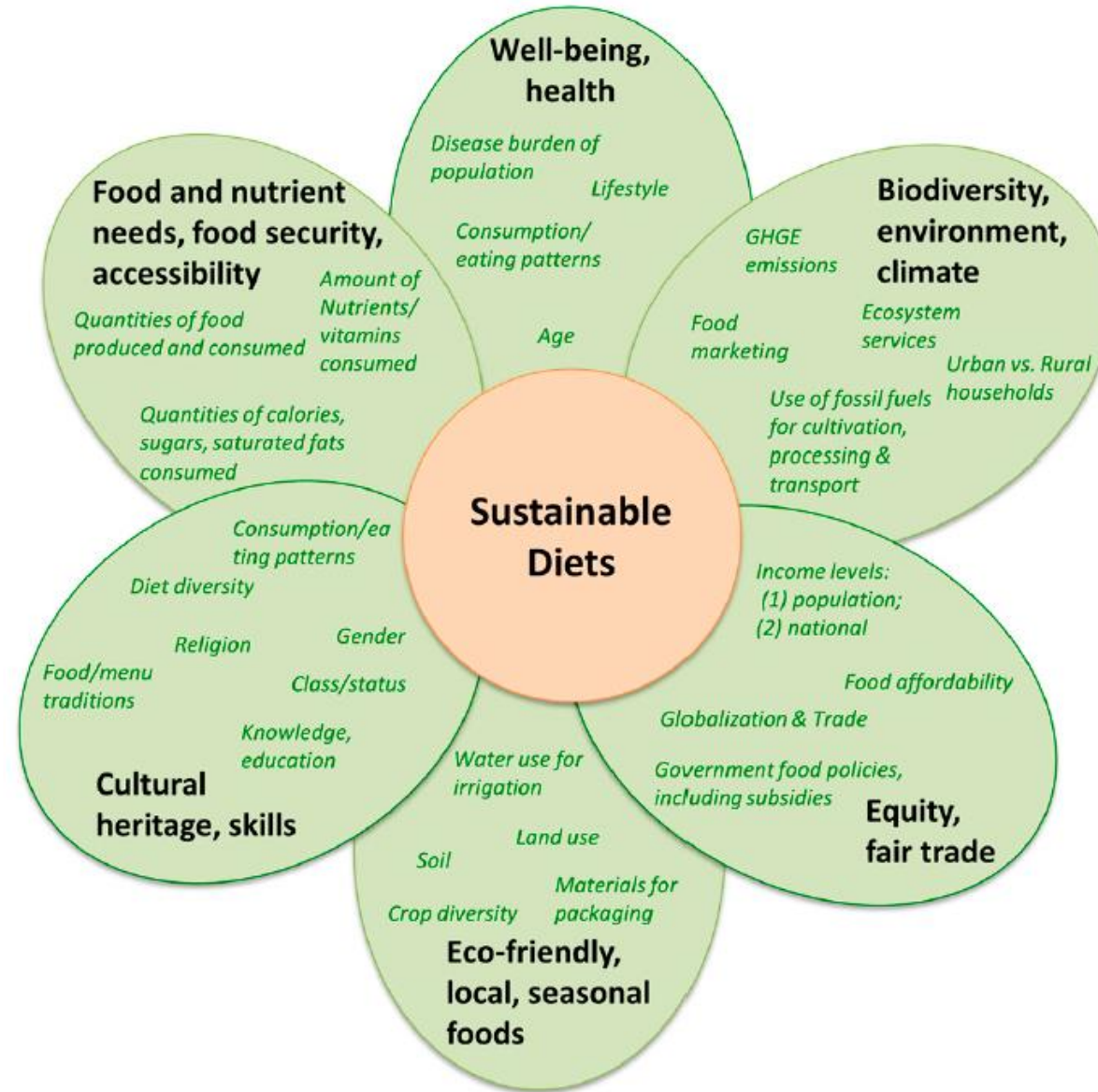


# The SDGs wedding cake

*a new way of viewing the SDGs and how they are all linked to food*



# The key components and determinants of a Sustainable Diet



(Johnson et al., 2014)

# The Diet Nexus

Relationship between diet and food style with:

- crop systems
- climate change
- land use change
- water consumption
- pollution
- landscape
- biodiversity
- food waste
- renewable energies
- local economy
- jobs
- culture
- health



Global Environmental Change

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Drivers for global agricultural land use change: The nexus of diet, population, yield and bioenergy

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# Agroecological sustainable and inclusive food systems

Designing new sustainable, inclusive, resilient, local food systems that:

- provide enough healthy food for 10 billion people by 2050
- stimulate a change toward diets healthy for humans and for the planet
- produce local, assorted, seasonal food
- protect small producers and processors
- avoid waste production
- protect biodiversity and landscape
- use renewable energy
- reduce consumption of resources
- low external inputs and GHG emissions
- favor the local economy
- re-evaluate the role of municipal wholesale markets, local markets and small retails (bakeries, greengrocers, butchers and fishmongers)
- generate stable and decent jobs
- are linked to local traditions and cultural identity





# Reducing Food Loss and Waste

- One of the main objectives to assure sustainable food systems is **reducing FLW**. This reduction would diminish economic losses of producers and the needed increase of production (FAO 2019a; The Eat-Lancet Commission 2019).
- The adoption of the Sustainable Development Goals (SDG) Agenda in 2015 at a global level (UN, 2015), and more specifically **SDG 12.3**, aiming to **halve food waste and to reduce food loss by 2030**, has been highlighted as an important milestone that is triggering a surge in scientific studies linked to FLW (Spang et al., 2019).





# FOOD loss waste

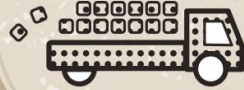
## Inadequate processing and packaging

Capacity development, availability of raw materials and technologies, and access to modern energy and markets.



## Lack of transportation and distribution systems

Capacity for transport, infrastructure and logistics.



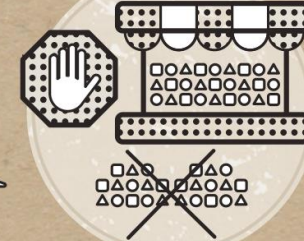
## Production and harvest waste

Effective planning, contractual agreements and networks for recovery of safe and nutritious food.



## Wholesale and retail systems inefficiencies

Adequate planning, management, labelling, and marketing.



## Inadequate storage facilities and techniques

Capacity development, access to energy, inputs, investments and market information.



Sustainable food systems provide safe and nutritious food for human consumption and contribute to climate resilience

Food loss measurement and prevention at local, national, regional and global level



Safe and nutritious food available for human consumption prevented from becoming waste and discard

Informed behaviour, sustainable consumption/production, partnerships



## Hotels, restaurants, catering and households waste

Appropriate planning, consumer education, food utilisation.



## Production and harvest losses

Sustainable technical, social, economic and environmental practices and training. Coherent investments for short, medium and long term returns.



## Food waste and discards along supply chains

Prevent and reduce safe and nutritious food removal from supply chains. Reduced impact on climate change.



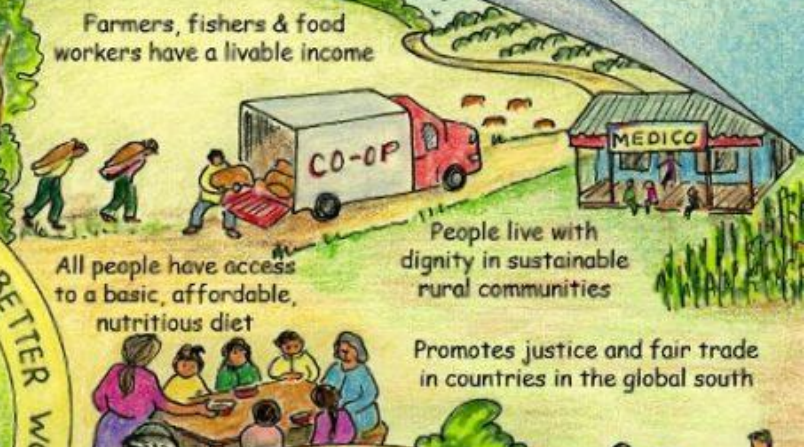
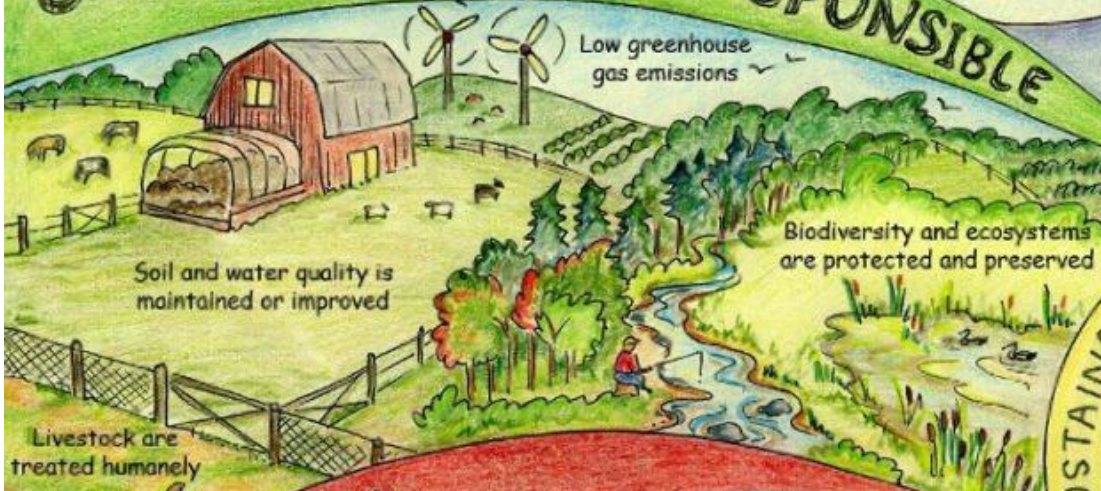




# SUSTAINABLE FOOD IS

## ECOLOGICALLY RESPONSIBLE

## FAIR AND ACCESSIBLE



Supports local farms, fishers, producers, businesses and community development

Healthy Food is a key foundation for healthy humans

Packaging and waste kept out of landfills  
Fewer resources used to meet needs  
Reusing keeps materials in circulation